UNIV. OF
TORONTO
LIBRARY

SHOUT
SHARE
IT

BINDING LIST OCT 1 5 1922

acc to
museum
Science
A

UNIVERSITY OF TORONTO LIBRARY

BULLETIN

OF

THE AMERICAN MUSEUM OF NATURAL HISTORY

VOLUME XLIII, 1920-1921

175747
16/11/22

NEW YORK
PUBLISHED BY ORDER OF THE TRUSTEES
1920–1921

UNIVERSITY OF TORONTO LIBRARY

QH
1
A4
v. 43

EDITED BY FRANK E. LUTZ

THE AMERICAN MUSEUM OF NATURAL HISTORY

SEVENTY-SEVENTH STREET AND CENTRAL PARK WEST, NEW YORK CITY

BOARD OF TRUSTEES

(As of December 31, 1921)

PRESIDENT

HENRY FAIRFIELD OSBORN

FIRST VICE-PRESIDENT

CLEVELAND H. DODGE

SECOND VICE-PRESIDENT

J. P. MORGAN

TREASURER

HENRY P. DAVISON

SECRETARY

PERCY R. PYNE

EX-OFFICIO

THE MAYOR OF THE CITY OF NEW YORK
THE COMPTROLLER OF THE CITY OF NEW YORK
THE PRESIDENT OF THE DEPARTMENT OF PARKS

ELECTIVE

GEORGE F. BAKER
GEORGE F. BAKER, JR.
FREDERICK F. BREWSTER
THOMAS DEWITT CUYLER
WALTER DOUGLAS
CHILDS FRICK
MADISON GRANT
WILLIAM AVERELL HARRIMAN
ARCHER M. HUNTINGTON
ADRIAN ISELIN
ARTHUR CURTISS JAMES
WALTER B. JAMES
CHARLES LANIER
OGDEN MILLS
A. PERRY OSBORN
GEORGE D. PRATT
THEODORE ROOSEVELT
LEONARD C. SANFORD
JOHN B. TREVOR
FELIX M. WARBURG

ADMINISTRATIVE OFFICERS

(As of December 31, 1921)

DIRECTOR

FREDERIC A. LUCAS

ASSISTANT SECRETARY

GEORGE H. SHERWOOD

ASSISTANT TREASURER

THE UNITED STATES TRUST COMPANY OF NEW YORK

Scientific Staff

(As of December 31, 1921)

DIRECTOR

Frederic A. Lucas, Sc.D.

GEOLOGY AND INVERTEBRATE PALÆONTOLOGY

Edmund Otis Hovey, Ph. D., Curator
Chester A. Reeds, Ph.D., Associate Curator of Invertebrate Palæontology

MINERALOGY

Herbert P. Whitlock, C.E., Curator

WOODS AND FORESTRY

(Curatorship Vacant)

LOWER INVERTEBRATES

Henry E. Crampton, Ph.D., Honorary Curator
Roy W. Miner, A.B., Associate Curator (In Charge)
Willard G. Van Name, Ph.D., Assistant Curator

ENTOMOLOGY

Frank E. Lutz, Ph.D., Curator
A. J. Mutchler, Assistant in Coleoptera
Frank E. Watson, B.S., Assistant in Lepidoptera
Joseph Bequaert, Ph.D., Assistant in Congo Zoology

ICHTHYOLOGY

Bashford Dean, Ph.D., Honorary Curator
John T. Nichols, A.B., Associate Curator of Recent Fishes
E. W. Gudger, Ph.D., Associate in Ichthyology

HERPETOLOGY

G. K. Noble, A.M., Assistant Curator (In Charge)
Karl Patterson Schmidt, A.B., Assistant Curator

ORNITHOLOGY

Frank M. Chapman, Sc.D., Curator
W. DeW. Miller, Associate Curator
Robert Cushman Murphy, Sc.D., Associate Curator of Marine Birds
James P. Chapin, A.M., Assistant Curator, African Birds
Ludlow Griscom, A.M., Assistant Curator

MAMMALOGY

Roy C. Andrews, A.M., Associate Curator of Mammals of the Eastern Hemisphere
H. E. Anthony, A.M., Associate Curator of Mammals of the Western Hemisphere
Herbert Lang, Assistant Curator, African Mammals
Carl E. Akeley, Associate in Mammalogy

VERTEBRATE PALÆONTOLOGY

Henry Fairfield Osborn, LL.D., D.Sc., Honorary Curator
W. D. Matthew, Ph.D., Curator
Walter Granger, Associate Curator of Fossil Mammals
Barnum Brown, A.B., Associate Curator of Fossil Reptiles
William K. Gregory, Ph.D., Associate in Palæontology

COMPARATIVE ANATOMY

William K. Gregory, Ph.D., Curator
S. H. Chubb, Assistant in Osteology

ANTHROPOLOGY

Clark Wissler, Ph.D., Curator
Pliny E. Goddard, Ph.D., Curator of Ethnology
N. C. Nelson, M.L., Associate Curator of North American Archæology
Charles W. Mead, Assistant Curator of Peruvian Archæology
Louis R. Sullivan, A.M., Assistant Curator, Physical Anthropology

COMPARATIVE PHYSIOLOGY

Ralph W. Tower, Ph.D., Curator

PUBLIC HEALTH

Charles-Edward Amory Winslow, D.P.H., Curator

PUBLIC EDUCATION

George H. Sherwood, A.M., Curator
G. Clyde Fisher, Ph.D., Associate Curator
Ruth Crosby Noble, A.B., Assistant Curator
Grace Fisher Ramsey, Assistant

LIBRARY AND PUBLICATIONS

Ralph W. Tower, Ph.D., Curator
Ida Richardson Hood, A.B., Assistant Librarian

RESEARCH ASSOCIATES

Alessandro Fabri, Physiology
Clarence L. Hay, A.M., Mexican and Central American Archæology
George F. Kunz, Ph.D., Gems
Charles W. Leng, B.S., Coleoptera
J. Howard McGregor, Ph.D., Human Anatomy
Frank J. Meyers, Rotifera
Herbert F. Schwarz, A.M., Hymenoptera
A. L. Treadwell, Ph.D., Annulata
William M. Wheeler, Ph.D., Social Insects

CONTENTS OF VOLUME XLIII

PAGE
Title-page i
Officers and Trustees iii
Scientific Staff iv
Contents vi
Dates of Publication of Separata vi
List of Illustrations vii
List of New Taxonomic Names xi
Errata xiii

Art. I.—Parasitic Copepods From the Congo Basin. By CHARLES BRANCH WILSON. (Plates I–III) 1
II.—Tipulidæ Collected by the American Museum Congo Expedition. By CHARLES P. ALEXANDER. (Plate IV, one text figure) 9
III.—Neuroptera, Panorpata, and Trichoptera Collected by the American Museum Congo Expedition, With Lists of the Species Known from the Belgian Congo. By NATHAN BANKS 21
IV.—African Stone-Flies and May-Flies Collected by the American Museum Congo Expedition. By JAMES G. NEEDHAM. (Plate V) 35
V.—Isopods Collected by the American Museum Congo Expedition. By WILLARD G. VAN NAME. (One hundred and twenty-six text figures) 41
VI.—Lepidoptera of the Congo, Being a Systematic List of the Butterflies and Moths Collected by The American Museum of Natural History Congo Expedition, Together with Description of Some Hitherto Undescribed Species. By W. J. HOLLAND. (Plates VI–XIV and nine text figures) 109
VII.—Amphipods Collected by the American Museum Congo Expedition, 1909–1915. By CLARENCE R. SHOEMAKER. (Six text figures) 371
VIII.—The Brachyuran Crabs Collected by the American Museum Congo Expedition, 1909–1915. By MARY J. RATHBUN. (Plates XV–LXIV, one map, and twenty-two text figures) .. 379
Index to Article VI 333
Index to Article VIII 469
Index to Articles I–V, VII 475

DATES OF PUBLICATION OF SEPARATES

The edition of separates is 300 copies, of which about 100 are mailed on the date of issue, and the others placed on sale in the Library.

Art. I,	April 22, 1920.	Art. V,	Sept. 27, 1920.
" II,	" 24, 1920.	" VI,	Dec. 4, 1920.
" III,	" 26, 1920.	" VII,	" 30, 1920.
" IV,	" 28, 1920.	" VIII,	Sept. 30, 1921.

LIST OF ILLUSTRATIONS

Plates

I.—The male and female of *Argulus reticulatus.*

II.—The male and female of *Argulus amblophites.*

III.—The females of *Lernæa haplocephala* and *Brachyella macrura.*

IV.—Wings of *Limnobia congoensis, Lecteria africana, Tipula dolichopezoides, T. langi, Nephrotoma chapini,* and *N. ruwenzoriana.*

V.—*Pentagenia schoutedeni, Cænopsis fugitans, Neoperla dubia,* and *N. excisa.*

VI.—*Planema nelsoni, Papilio ridleyanus, P. r. fumosus, Hypolimnas bartteloti* var. *obliterata, Cymothoë diphyia,* and *Neptis agatha.*

VII.—*Bicyclus medontias* var. *obsoletus, Euphædra imitans, Precis stygia stygia, P. s. gregorii, P. s. fuscata, Cymothoë cyclades, Kallimula osborni, Mycalesis chapini,* and *Euryphene maximiniana.*

VIII.—*Cymothoë herminia, C. h.* var. *poënsis, Neptis biafra, Cymothoë capellides, C. capella, C. langi,* and *C. adelina.*

IX.—*Euphædra cyanea, Cymothoë cænis* var. *conformis, Euryphene lucasi, Euphædra medon* var. *innotata,* and *Cymothoë cænis* var. *rubida.*

X.—*Cymothoë aramis, C. ogova, C. Reginæ-Elizabethæ, C. anatorgis, C. angulifascia, Mycalesis langi,* and *Euryphene fulgurata.*

XI.—*Euphædra preussi notata, E. inanoides, E. preussi subviridis, E. rezioides, E. preussi fulvofasciata, E. p. angustior,* and *E. p. latefasciata.*

XII.—*Abantis rubra, Triclema lutzi, Leptalina niangarensis, Spindasis aderna, Oxylides homeyeri, Spindasis chapini, Telipna rothioides, T. medjensis, Pentila clætensi, Epitola langi, Pentila clarensis, Diestogyna kahli,* and *D. rotundata.*

XIII.—*Xanthospilopteryx medjensis, Amphicollia pactolica, Pitthea famulita, Metarctia chapini, Pseudogonitis variabilis, Eutelia nigricans, Tolna bolengensis, Rhynchodes avakubi, Amphigonia hyalinata, Heterospila* (?) *rubida, Leocyma congoënsis, Sphingomorpha aliena, Dermaleipa nubilata, Deinypena fulvida, D. transversata, D. morosa,* and *Pseudoterpna* (?) *chapinaria.*

XIV.—*Leipoxais punctulata, Sapelia bipunctata, Deinypena multilineata, Osteosema phyllobrota, Lælia soloides, Callocossus langi, Gonanticlea* (?) *langaria, Ctenogyna* (?) *medjensis, Deinypena obscura, Proterozeuxis* (?) *medjensis, Rhamidava pieridara,* and *Phasicnecus grandiplaga.*

XV.—*Geograpsus lividus* and *Callinectes latimanus.*

XVI.—*Sarmatium curvatum* and its habitat.

XVII.—Habitat of *Cardisoma armatum.*

XVIII.—*Pisa carinimana* and *Dromia atlantica.*

XIX.—*Callinectes marginatus* and *C. gladiator.*

XX.—*Callinectes marginatus* and *Potamon* (*Potamonautes*) *floweri.*

XXI.—*Callinectes latimanus.*

XXII.—*Callinectes latimanus* and *Geograpsus lividus.*

XXIII.—*Thalamita africana.*

XXIV.—*Potamon* (*Potamonautes*) *dybowskii.*

XXV.—*Potamon* (*Potamonautes*) *lirrangensis.*

XXVI.—*Potamon* (*Potamonautes*) *stanleyensis* and *P.* (*P.*) *lirrangensis.*

XXVII.—*Potamon* (*Potamon*) *ballayi.*

XXVIII.—*Potamon* (*Potamon*) *ballayi*, *P.* (*Geothelphusa*) *perparvus*, and *P.* (*G.*) *congoënsis*.
XXIX.—*Potamon* (*Geothelphusa*) *congoënsis*.
XXX.—*Potamon* (*Geothelphusa*) *perparvus*.
XXXI.—*Potamon* (*Acanthothelphusa*) *faradjensis*.
XXXII.—*Potamon* (*Acanthothelphusa*) *langi*.
XXXIII.—*Erimetopus brazzæ*.
XXXIV.—*Deckenia mitis*.
XXXV.—*Menippe nanus* and *Pilumnus verrucosipes*.
XXXVI.—*Pilumnus verrucosipes* and *Eurypanopeus blanchardi* (?).
XXXVII.—*Panopeus africanus*.
XXXVIII.—*Grapsus grapsus*.
XXXIX.—*Goniopsis cruentata*.
XL.—*Pachygrapsus gracilis* and *P. transversus*.
XLI.—*Sesarma* (*Chiromantes*) *africanum*.
XLII.—*Sesarma* (*Chiromantes*) *alberti*, *S.* (*C.*) *africanum*, and *Sarmatium curvatum*.
XLIII.—*Sesarma* (*Holometopus*) *angolense*.
XLIV.—*Sesarma* (*Holometopus*) *elegans*.
XLV.—*Sesarma* (*Holometopus*) *angolense*, *S.* (*H.*) *elegans*, and *Uca tangeri*.
XLVI.—*Sarmatium curvatum*.
XLVII.—*Sarmatium curvatum*, *Cyclograpsus occidentalis*, and *Sesarma* (*Holometopus*) *büttikoferi*.
XLVIII.—*Cardisoma armatum* and *Sesarma* (*Chiromantes*) *alberti*.
XLIX.—*Cardisoma armatum*.
L.—*Cardisoma armatum*.
LI.—*Cardisoma armatum*.
LII.—*Ocypode ippeus*.
LIII.—*Ocypode africana*.
LIV.—*Uca tangeri*.
LV.—Shore of the Atlantic Ocean near San Antonio, Angola. Sandy cove on left bank of Congo estuary near San Antonio.
LVI.—Shore on east side of Banana peninsula, at incoming tide. Shore vegetation along bay north of San Antonio, at low tide.
LVII.—Wild date palms, north of Banana, after a grass fire. Laterite blocks on the beach of the Atlantic near Moanda.
LVIII.—Forest of mangroves bordering a creek near Malela, at high tide.
LIX.—Interior of a mangrove forest near Malela, at low tide.
LX.—Forest of mangroves bordered by *Raphia* near Malela, at incoming tide. Edge of bushy mangrove formation along Banana Creek, at low tide.
LXI.—Bank of the Congo about 17 miles from Banana, between Malela and Ponta da Lenha, at low tide.
LXII.—Bank of the Congo just below Malela, at outgoing tide.
LXIII.—Tschopo River near Stanleyville, at low water, in March.
LXIV.—Forest brook in the Rain Forest of the Northeastern Belgian Congo south of Poko, at the end of January.

TEXT FIGURES PAGE

Details of pupa of *Tipula* species from Mt. Ruwenzori 18
Eurydice carangis, new species: female and second pleopod of male 50

PAGE
Eurydice carangis, new species: mouth-parts of female 51
Eurydice carangis, new species: legs of female 52
Nerocila cephalotes: female 54
Nerocila cephalotes: young individuals 56
Nerocila rhabdota: female 58
Cymothoa plebeia: male 60
Ichthyoxenos expansus, new species: female 61
Ichthyoxenos expansus, new species: female 62
Sphæroma destructor: female 64
Sphæroma destructor: mouth-parts of female 65
Sphæroma destructor: legs of female 66
Pleurocrypta langi, new species: dorsal and ventral aspects and first opercular plate 68
Pseudione chapini, new species: dorsal and ventral aspects of female and male . . 70
Ligyda exotica: female 74
Ligyda exotica: legs of female and male 75
Ligyda olfersii: female 76
Ligyda olfersii: legs of female and male 77
Eubelum stanleyanum, new species: female and details of structure of female and male 79
Eubelum stanleyanum, new species: female 80
Eubelum stipulatum: female and details of structure of female and male 82
Eubelum stipulatum: female 83
Eubelum propinquum, new species: details of structure of male 85
Eubelum asperius, new species: details of structure of female 86
Eubelum garambæ, new species: details of structure of female 88
Eubelum garambæ, new species: female 89
Eubelum tenebrarum, new species: female and details of structure of male and female 90
Eubelum tenebrarum, new species: female 91
Synarmadillo globus: male and details of structure of male 93
Synarmadillo globus: male 94
Synarmadillo lubilensis, new species: female and details of structure of female . 96
Synarmadillo lubilensis, new species: female 97
Cubaris bananæ, new species: female and details of structure of female and male 98
Cubaris regulus, new species: female and details of structure of female 101
Niambia squamata: female 103
Niambia squamata: male and details of structure of female and male 104
Deudorix batikelides, new species: female from Mombasa 222
Myopsyche langi, new species: male 263
Nola bananæ, new species: male 266
Deilemera anomala, new species: male and female 269
Lælia hildoides, new species: male 298
Acidalia medjaria, new species: male 312
Chrysopoloma nubila, new species: female 322
Saliunca rubriventris, new species: female 324
Phryganodes sex-guttata, new species: male 328

PAGE
Elasmopus congoënsis, new species: details of structure of male 372
Elasmopus congoënsis, new species: details of structure of male 372
Talorchestia tricornuta, new species: mature male 374
Talorchestia tricornuta, new species: details of structure of female and male 374
Talorchestia tricornuta, new species: details of structure of female and male 376
Talorchestia tricornuta, new species: details of structure 377
Map of the estuary of the Congo River showing localities where crabs have been collected 388
Dromia atlantica: details of structure of female 393
Callinectes marginatus: details of structure of male and female 396
Callinectes gladiator: details of structure of male and female 398
Callinectes latimanus: details of structure of male and female 399
Thalamita africana: details of structure of male and female 403
Potamon (Potamonautes) floweri: details of structure of male 408
Potamon (Potamonautes) dybowskii: details of structure of female and male 411
Potamon (Potamonautes) lirrangensis: details of structure of female and male. 414
Potamon (Potamonautes) stanleyensis, new species: details of structure of female and male 416
Potamon (Potamon) ballayi: details of structure of male 420
Potamon (Geothelphusa) congoënsis, new species: details of structure of male . . 423
Potamon (Geothelphusa) perparvus, new species: details of structure of male . . 426
Potamon (Acanthothelphusa) faradjensis, new species: details of structure of male and female 428
Potamon (Acanthothelphusa) langi, new species: details of structure of male and female 432
Erimetopus brazzæ: outer maxilliped of female 434
Deckenia mitis: details of structure of male 435
Menippe nanus: details of structure of male 436
Pilumnus verrucosipes: details of structure of female 437
Panopeus africanus: details of structure of male 439
Eurypanopeus blanchardi (?): details of structure of male 441
Cardisoma armatum: details of structure of male 457
Pisa carinimana: details of structure of female 467

LIST OF NEW TAXONOMIC NAMES IN THIS VOLUME

GENERA

	PAGE
Cœnopsis	39
Kallimula	149
Neptidomima	164

SPECIES, SUBSPECIES, AND VARIETIES

Argulus reticulatus	2
Argulus amblophtes	3
Brachiella macrura	7
Limnobia congoënsis	11
Lecteria africana	14
Tipula brunettiana	15
Tipula dolichopezoides	15
Tipula langi	16
Tipula langi rubricapilla	17
Nephrotoma chapini	19
Nephrotoma ruwenzoriana	20
Cœnopsis fugitans	39
Eurydice carangis	49
Ichthyoxenos expansus	60
Pleurocrypta langi	67
Pseudione chapini	69
Eubelum stanleyanum	78
Eubelum propinquum	84
Eubelum asperius	86
Eubelum garambæ	89
Eubelum tenebrarum	91
Synarmadillo lubilensis	95
Cubaris (Diploexochus) bananæ	97
Cubaris (Diploexochus) regulus	100
Bicyclus medontias var. *obsoletus*	132
Mycalesis langi	139
Mycalesis chapini	140
Precis stygia var. *fuscata*	148
Kallimula osborni	150
Hypolimnas bartteloti var. *obliterata*	156
Euphædra preussi var. *notata*	173
Euphædra preussi var. *subviridis*	174
Euphædra preussi var. *fulvofasciata*	174
Euphædra preussi var. *latefasciata*	175
Euphædra preussi var. *angustior*	175
Euphædra inanoides	175
Euphædra rezioides	177
Euphædra xypete var. *maxima*	178
Euphædra cyanea	178

	Page
Euphædra medon var. *innotata*	179
Euryphene lucasi	183
Diestogyna kahli	191
Diestogyna rotundata	191
Cymothoë herminia var. *poënsis*	196
Cymothoë langi	197
Cymothoë capellides	198
Cymothoë cœnis form *rubida*	199
Cymothoë Reginæ-Elizabethæ	201
Cymothoë ogova var. *rubescens*	203
Charaxes protoclea var. *marginepunctata*	206
Telipna rothioides	214
Telipna medjensis	214
Epitola langi	217
Deudorix batikelides	221
Spindasis chapini	225
Triclema lutzi	229
Oboronia ornata var. *flava*	235
Mylothris spica form *donovani*	236
Papilio ridleyanus var. *fumosus*	247
Abantis rubra	253
Leptalina niangarensis	256
Myopsyche langi	262
Metarctia chapini	264
Nola bananæ	266
Deilemera (?) *anomala*	268
Xanthospilopteryx medjensis	271
Eutelia nigricans	274
Pseudogonitis variabilis	275
Leocyma congoïnsis	277
Dermaleipa nubilata	278
Tolna bolengensis	280
Anua hampsoni	280
Sphingomorpha aliena	285
Rhynchodes avakubi	287
Rhynchodes efulensis	287
Amphigonia hyalinata	288
Heterospila (?) *rubida*	289
Deinypena morosa	291
Deinypena morosa var. *pallidior*	292
Deinypena fulvida	292
Deinypena multilineata	292
Deinypena transversata	293
Deinypena obscura	294
Sapelia bipunctata	295
Leucoperina kahli	296
Lælia hildoides	298

	Page
Lælia soloides	299
Phasicnecus grandiplaga	304
Ctenogyna (?) *medjensis*	305
Rhamidava (?) *pieridaria*	307
Pitthea famulita	310
Gonanticlea (?) *langaria*	311
Acidalia (?) *medjaria*	312
Osteosema (?) *phyllobrota*	313
Pseudoterpna (?) *chapinaria*	314
Eudæmonia brachyura var. *minor*	316
Callocossus langi	318
Leipoxais punctulata	320
Chrysopoloma nubila	322
Saliunca rubriventris	324
Proterozeuxis (?) *medjensis*	325
Phryganodes sex-guttata	328
Elasmopus congoënsis	371
Talorchestia tricornuta	373
Potamon (*Potamonautes*) *stanleyensis*	415
Potamon (*Geothelphusa*) *congoënsis*	422
Potamon (*Geothelphusa*) *perparvus*	425
Potamon (*Acanthothelphusa*) *faradjensis*	428
Potamon (*Acanthothelphusa*) *langi*	430
Sesarma (*Chiromantes*) *alberti*	448

ERRATA

Page 60, Figs. 12–13, read *Cymothoa* for *Cymothea*.

BULLETIN

OF

THE AMERICAN MUSEUM OF NATURAL HISTORY

VOLUME XLIII, 1920

59.53, 4:16.9 (67.5)

Article I.—PARASITIC COPEPODS FROM THE CONGO BASIN[1]

BY CHARLES BRANCH WILSON

DEPARTMENT OF BIOLOGY, STATE NORMAL SCHOOL, WESTFIELD, MASSACHUSETTS

PLATES I TO III

The Congo Expedition of The American Museum of Natural History, 1909–1915, brought back a small number of parasitic copepods, Messrs. Lang and Chapin collectors. These were turned over to me for identification and prove to be of considerable interest.

Our previous knowledge of African species was chiefly confined to two papers by Dr. W. A. Cunnington, who had charge of the Third Expedition sent to Lake Tanganyika by The Zoological Society of London. These papers were published in the Proceedings of the Society, the first in 1913, pp. 262–283, Pls. XLI–XLV; the second in 1914, pp. 819–829, Pl. I. The former described seven new species of *Argulus* from the Lake and an eighth, *Argulus africanus* Thiele, found also in Lakes Victoria Nyanza and Albert Nyanza, and in the Nile River. The latter contained three new species of *Lernæa* (*Lernæocera*), all from Lake Tanganyika.

One of these latter species is included in the present material and thereby proves that it is not confined to the Lake, but is found also in the Congo River Basin. Cunnington gave a photograph of the species and described its general appearance, but the appendages are here described and figured for the first time. On the other hand, the two

---

[1] Scientific Results of The American Museum of Natural History Congo Expedition. General Invertebrate Zoology, No. 3.

Argulus species are decidedly different from any of those found in the Lake, and the *Brachiella* from a salt-water fish at the mouth of the Congo River also proves to be new. Accordingly, all four of the species merit a detailed description and figures of the more important appendages.

Argulus reticulatus,[1] new species

Plate I

Host and Record of Specimens.—Three females and three males were taken from the gills of *Hydrocyon goliath* Boulenger, at Malela near the mouth of the Congo River, July 5, 1915.

Specific Characters of Female

Carapace elliptical, distinctly longer than wide, reaching nearly to the center of the abdomen and entirely concealing the legs in dorsal view; posterior sinus two-fifths the length of the carapace and quite narrow, with parallel sides; posterior lobes broadly rounded; cephalic area scarcely projecting.

Abdomen transversely elliptical, a fourth wider than long, evenly rounded: anal sinus one-third the length of the abdomen, anal laminæ basal.

First antennæ with a short spine at the posterior corner of the basal joint, stout anterior and lateral claws on the second joint, and a short curved spine on the posterior margin. The basal joint of the second antennæ is considerably thickened, with a long slender spine on its posterior margin; the terminal joints are comparatively slender. The eyes are of medium size and well separated. The sucking disks are large, one-sixth the diameter of the carapace, and quite close together some distance behind the antero-lateral sinuses. The supporting rods in the margins of the suckers are separated quite a distance one from another. Each is composed of a short basal portion, somewhat enlarged at its base, and two terminal cylindrical portions, joined end to end or nearly so. Maxillipeds rather slender; basal plates narrow triangular, prolonged posteriorly into three flattened laminæ, separated by wide triangular sinuses; roughened area small, ovate, produced into a long narrow point anteriorly. First two pairs of swimming legs with flagella; lobes on the fourth legs with a tiny "heel" and a short pointed "toe," quite like the shoes in vogue amongst Chinese ladies of the upper classes half a century ago.

Respiratory areas divided into two portions, the anterior one triangular with rounded corners, the posterior one a little wider and four times as long, curved parallel with the lateral margin of the carapace.

Color (preserved material) a yellowish gray, the dorsal surface of the carapace covered with a network of irregular black lines, except around the eyes and through the center of the cephalic and thoracic areas.

On the dorsal surface of the abdomen and at the anterior ends of the lateral areas of the carapace the pigment is gathered into isolated, rounded spots.

Total length, 8 mm. Carapace, 7.50 mm. long, 6 mm. wide. Abdomen, 1.50 mm. long, 1.75 mm. wide.

---

[1] *Reticulatus*: net-like, alluding to the black pigment on the carapace of the female.

Specific Characters of Male

Carapace a little shorter than in the female, but still overlapping the base of the abdomen; cephalic area projecting more strongly and relatively wider; posterior sinus a little more than a quarter of the length of the carapace, narrow triangular.

Abdomen slightly wider than long with an evenly rounded outline; anal sinus a mere slit, one-fourth the length of the abdomen, anal laminæ basal.

Eyes considerably larger than in the female. Swimming legs projecting beyond the margins of the carapace, the lobes on the fourth pair longer and more pointed. Of the accessory sexual apparatus the peg on the second joint of the fourth legs is of medium size, while the semen receptacle on the third legs is exceptionally large and projects strongly from the posterior margin.

Color, the same as in the female except that the black pigment is in widely scattered spots instead of a continuous network.

Total length, 6 mm. Carapace, 5 mm. long, 4 mm. wide Abdomen, 1.25 mm. long, 1.30 mm. wide.

Remarks.—Mention has been made of eight African species already reported; from them and from all other species, the present one is distinguished by the intricate reticulation of the dorsal surface of the female, by the squarely truncated teeth on the basal plate of the maxillipeds, by the peculiar pattern of the respiratory areas of the carapace, by the structure of the supporting rods of the marginal membranes of the sucking disks. and by the peculiar lobes on the fourth legs of the female.

Argulus ambloplites,[1] new species

Plate II

Host and Record of Specimens.—A male and female were secured from the outside surface of the gills of *Ophiocephalus obscurus* Günther at Faradje on the Dungu River, very near the headwaters of that part of the Congo River Basin which is north of Lake Albert Nyanza and close to the watershed separating the Congo from the Nile Basin.

Specific Characters of Female

Carapace ovate, considerably longer than wide and reaching beyond the center of the abdomen, with the posterior lobes considerably narrowed and turned inward; cephalic area broadly triangular and projecting moderately; lateral areas spindle-shaped, narrowed both anteriorly and posteriorly; posterior sinus a little more than one-third the length of the carapace and somewhat enlarged at its base.

Abdomen ovate, widest at its base, with broadly rounded sides and posterior lobes; anal sinus less than one-eighth the length of the abdomen, as wide as deep, squarely truncated at its base, anal laminæ basal.

First antennæ of medium size, basal joint with a blunt posterior process re-

---

[1] *Ambloplites:* ἀμβλύς, blunt, and ὁπλῖτες, armed, alluding to the spines on the antennæ and maxillipeds and the accessory processes.

enforced by a much larger one behind the insertion of the antenna; second segment with stout anterior and lateral claws and a small posterior spine opposite the anterior claw; second antennæ with a long blunt process on the basal segment. Eyes rather small, separated by a distance a little less than one-fourth the width of the carapace, and situated just in front of the lateral sinuses; median eye very small and far behind the lateral eyes. Sucking disks about one-eighth the diameter of the carapace and opposite the lateral sinuses and widely separated. Maxillipeds of medium size, the basal plate broadly triangular, produced posteriorly into three flattened laminæ, which are squarely truncated and pressed so tightly together that the sinuses between them are mere lines. On the ventral surface inside the base of each maxilliped is an accessory process, also flattened into a wide, squarely truncated lamina. The first two pairs of swimming legs with flagella; the basal lobes on the posterior pair small and rectangular.

Respiratory areas divided, the anterior portion a little more than half the diameter of the posterior, ovate, with its long axis inclined backwards and inwards; the posterior portion somewhat enlarged at either end.

Color (preserved material) a uniform gray-brown.

Total length, 5 mm. Carapace, 4.50 mm. long, 3.75 mm. wide. Abdomen, 1.12 mm. long, 1 mm. wide.

Specific Characters of Male

Carapace elliptical, not narrowed posteriorly and not reaching the base of the abdomen, but distinctly longer than wide; cephalic area projecting more than in the female but relatively narrower; posterior sinus a little more than one-fourth the length of the carapace, with parallel sides.

Abdomen ovate, a little longer than wide, less than a quarter of the entire length, lobes broadly rounded; anal sinus one-fifth the length of the abdomen and narrower than in the female.

Lobes on the posterior swimming legs extended laterally into a broad and blunt cone; of the accessory sexual apparatus the peg on the fourth legs is exceptionally large, as is also the semen receptacle on the third legs, and there is a long rounded process extending backward from the center of the ventral surface of the second legs.

Color, a little lighter than that of the female.

Total length, 7 mm. Carapace, 5.30 mm. long, 4.50 mm. wide. Abdomen, 1.60 mm. long, 1.50 mm. wide.

Remarks.—This species is clearly distinguished from all the African forms by the conspicuous overlapping of the abdomen by the carapace lobes in the female, by the wide and shallow anal sinus of both sexes, and by the blunt armature, especially of the maxillipeds.

These two argulids, coming as they do from widely distant localities, one at the very headwaters of the Congo River and the other close to its mouth, suggest that the whole basin may yield specimens upon further examination. They are closely related to Thiele's *A. africanus* and to the present author's *A. americanus*, but may be recognized by the characters above given.

Lernæa haplocephala (Cunnington)

Plate III, Figures 20 to 22

Host and Record of Specimens.—Eight females were obtained from the outside skin and flesh of *Polypterus ornatipinnis* Boulenger at Faradje on the Dungu River, one of the headwaters of the Congo. One was obtained January 1912, four in February 1912, one in January 1913, and two in February 1913. They were all found on the sides of the body near the tail; they had penetrated the skin between the scales, and their cephalothorax with its processes was enclosed in a tough cyst just beneath the skin. In obtaining the four, Feb. 25, 1912, the skin, the scales, and a thin layer of flesh were removed entire with the parasites *in situ;* these specimens are excellently preserved.

Specific Characters of Female

General form thick and stout; cephalothorax with four large fleshy processes or horns, two ventral and two dorsal, very similar to those of *L. cruciata*. Each horn is conical, thick, and often flattened laterally at the base and tapered to a bluntly rounded point. The ventral horns are swollen a little more than the dorsal, especially on their ventral margins and toward their tips. The four horns are arranged like the letter X and each is a little more than one-fifth of the entire length. The neck behind the cephalothorax increases gradually in diameter back to the pregenital prominence. Just behind the horns and external to the second pair of legs there is a swelling on either side of the neck which projects ventrolaterally, the two coming together across the midline on the ventral surface, but not extending on the dorsal surface. These accessory processes correspond to those found in *L. variabilis* behind the primary horns.

The pregenital prominence is exceptionally large, not bilobed, and spherical in shape. It projects more than half its diameter, giving the body a decided boot or foot shape. The toe of the boot is the abdomen, which is somewhat inclined to the body axis and whose diameter is nearly equal to that of the body in front of the pregenital prominence. It is a half longer than wide, the same diameter throughout, bluntly rounded, and shows no signs of anal laminæ.

The first pair of swimming legs is on the ventral surface of the cephalothorax between the bases of the ventral horns; the second pair is on the ridge connecting the two accessory prominences just behind the horns. The relative distances of the four pairs of legs from the anterior margin of the cephalothorax, calling the entire length of the body 100, are 11.15:35:70.

In the specimen from which the drawing of the entire animal was made there was a torsion of 180, the fourth legs being apparently on the side of the body opposite the first pair.

No egg-strings were found upon any of the present specimens, but Cunnington stated that the egg-sacs were moderately long, about one-fifth the length of the body, and tapering. Each contains four or five rows of eggs, with twenty-five or thirty in a row.

Head fairly large and ovate, being narrowed anteriorly between the bases of the antennæ; the anterior margin of the narrowed portion is somewhat reëntrant at the center. The first antennæ are three-jointed and well armed with setæ, the second pair are two-jointed, the joints of the same length, the terminal one armed at the tip with curved claws and several short setæ. The maxillipeds are stout, the terminal joint small, spherical, and tipped with four stout curved claws.

Color (preserved material), a uniform yellowish white.

Total length, 10 mm. Transverse length of dorsal and ventral arms and the head, 3.80 mm. Greatest diameter of the body, 1 mm.

Remarks.—This is one of the three species established by Dr. Cunnington in 1914; his type specimen was taken from the soft region at the junction of the pelvic fins of a large *Polypterus congicus* Boulenger. Other specimens were obtained from different species of *Polypterus* in the White Nile, and, so far as recorded, they were found in the soft flesh at the junction of paired fins. But the present specimens, instead of choosing such a locality, burrowed in between the hard scales on the side of the body. Coming from the Dungu River, they extend the habitat of the species to the Congo Basin, and make it reasonably certain that this parasite is as widely distributed in Africa as is the genus of fish (*Polypterus*) upon which it is found. The present host is the fourth species of the genus from which this parasite has been obtained.

Cunnington gave some excellent photographs of the species and a good general description, but he did not locate the swimming legs, except the second pair, nor did he describe any of the appendages. These omissions are here supplied and, fortunately, they only emphasize the validity of the species.

Cunnington stated: "The appendages appear to show comparatively minor differences within the limits of this genus, and have not been appealed to for the purpose of establishing new species. Thus I have not deemed it necessary to study in detail the head appendages of my new forms since they are by no means easy to investigate, and my material, with one exception, was very scanty" (p. 283).

While this may be true in a measure, and while it may be advisable to base an artificial key upon characters easily observed, it should never be forgotten that the final decision of the validity of a species must always rest upon the structure of the appendages. Consequently, a description and figures of the appendages are more or less indispensable for the establishment of the species. Even in dealing with such bizarre forms as these lernæids, where species may be distinguished fairly well without resort to the appendages, the presentation of their details will avoid all question.

The distinguishing characters of this species are the well-developed and undivided pregenital prominence, the four horns of equal length arranged like the letter X, and the small spherical terminal joint of the maxillipeds, with its four curved claws.

Brachiella macrura,[1] new species

Plate III, Figures 23 to 28

Host and Record of Specimens.—Three females with egg-strings were obtained from the gills of an African snapper, *Neomænis fulgens* Cuvier and Valenciennes, at Banana on the mouth of the Congo River, July–August 1915.

Specific Characters of Female

Cephalothorax about the same length as the trunk, cylindrical and the same diameter throughout, and inclined backward at right angles to the trunk. Head neither enlarged nor separated in any way from the thorax, covered with an indistinct carapace. Maxillipeds nearly even with the anterior margin of the head and forming apparently a heavy under jaw; second maxillæ at the angle between the cephalothorax and the trunk. Trunk narrowed anteriorly into a very short neck, more or less wrinkled posteriorly, flattened dorsoventrally.

Four posterior processes of about the same length, two dorsal and two ventral; a genital process between the two latter and a little ventral to them, about half their length and the same diameter throughout, which is equal to that of the posterior processes.

Egg-strings arising between the ventral and dorsal processes and considerably more than twice their length, tapering gradually to a blunt point. Each string has a diameter at its base one-fourth greater than that of the processes, and contains five rows of eggs, forty to forty-five in a row, making the aggregate of each string a little over two hundred eggs.

First antennæ swollen at the base and three-jointed; second antennæ biramose and turned down squarely across the frontal margin of the head, the endopod (dorsal ramus) large and bluntly rounded, one-jointed and armed at the very tip with tiny spines, the exopod smaller, two-jointed, and tipped with a tuft of finger-like setæ. Mouth-tube short and wide, extending forward between the tips of the second antennæ. First maxillæ tripartite, the third division lateral and much smaller than the two terminal ones; palp one-jointed, bipartite, the rami very short and stout, each tipped with a single spine. Second maxillæ about one-third the length of the cephalothorax, slender, fused at the base and then separate as far as the bulla. Maxillipeds large and stout, the basal joint armed on its ventral surface near the inner margin with two large knobs, covered with small spines; the terminal claw has an accessory spine at its base.

---

[1] *Macrura:* μακρὸς, long, and οὐρά, tail, alluding to the genital process.

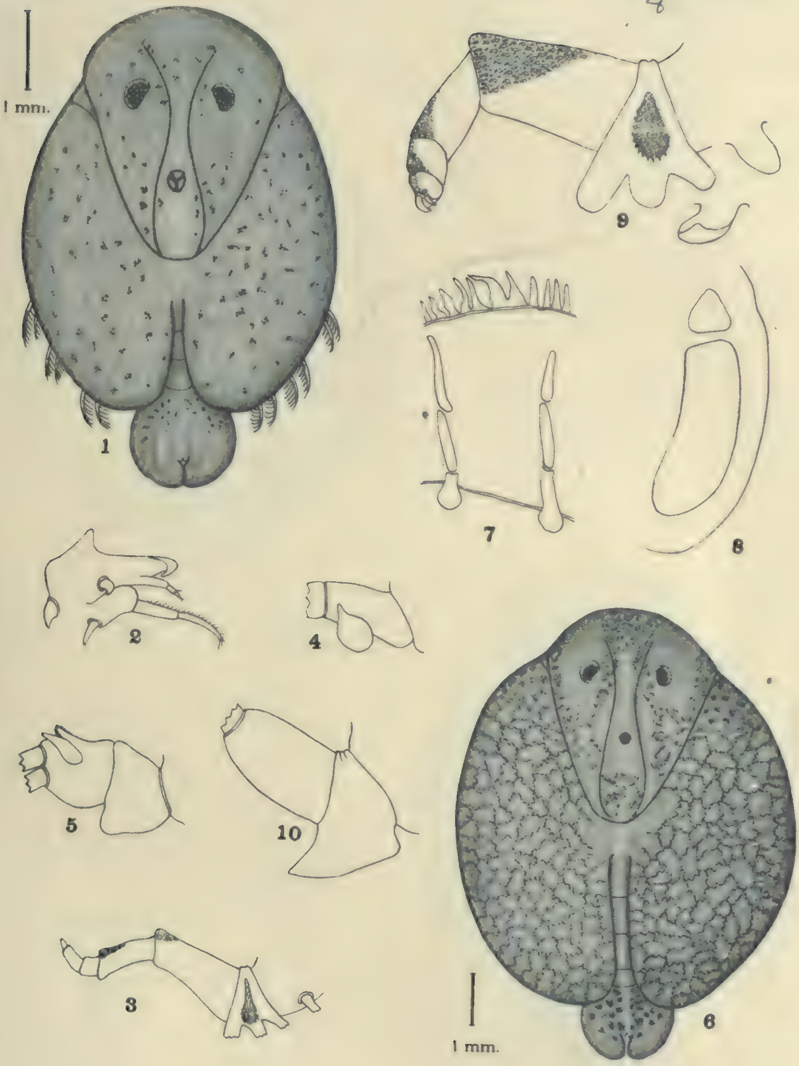
Color (preserved material), a brownish yellow.

Cephalothorax, 4 mm. long, 0.85 mm. in diameter. Trunk, 4 mm. long, 2 mm. wide, 1.75 mm. thick. Posterior processes, 4 mm. long. Egg-strings, 9 mm. long.

Remarks.—This species is most closely related to Beneden's *chevreuxii*, which is the only other one possessing a long genital process. But in *chevreuxii* the head is much enlarged and distinctly separated from the thorax, the trunk is as wide as long and nearly twice as wide as thick, and the egg-strings are only a trifle longer than the posterior processes.

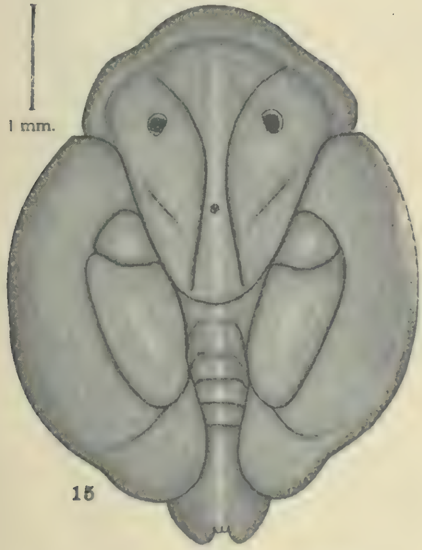
The name *macrura* is especially appropriate for this species because not only is the genital process (tail) longer than in any other species except *chevreuxii*, but the posterior processes and egg-strings are also exceptionally long. The combination of the three makes it a question as to whether in this case "the dog wags the tail or the tail wags the dog."

8'

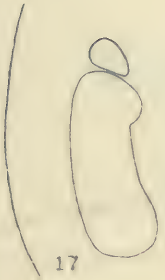


The Male and Female of *Argulus reticulatus*

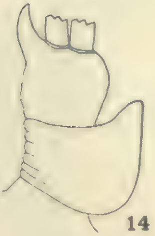
Fig. 1.	Dorsal view of male.
Fig. 2	First and second antennæ.
Fig. 3.	Maxilliped.
Figs. 4-5.	Third and fourth swimming legs.
Fig. 6.	Dorsal view of female.
Fig. 7.	Rods supporting the membrane of the sucking disks.
Fig. 8.	Respiratory areas of the carapace.
Fig. 9.	Maxilliped.
Fig. 10.	Fourth swimming leg.



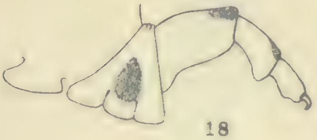
15



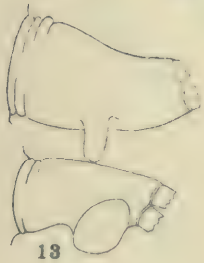
17



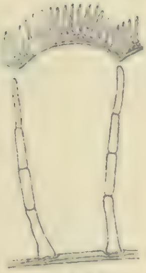
14



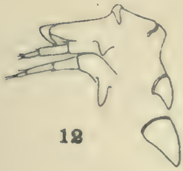
18



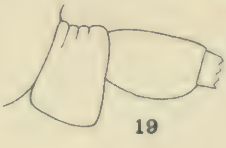
13



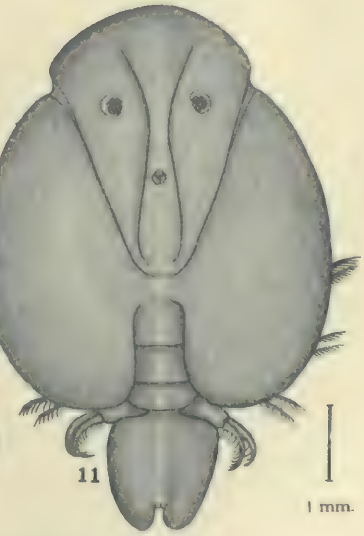
16



12



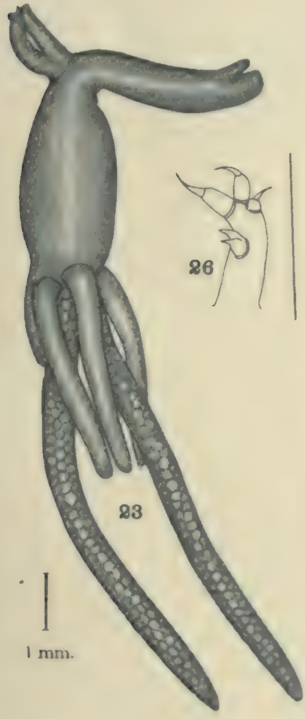
19



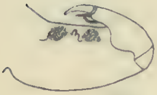
11

The Male and Female of *Argulus amblopltes*

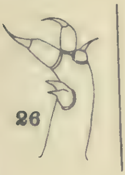
Fig. 11. Dorsal view of male.
Fig. 12. First and second antennæ.
Fig. 13. Second and third swimming legs.
Fig. 14. Fourth leg.
Fig. 15. Dorsal view of female.
Fig. 16. Rods supporting the membrane of the sucking disks.
Fig. 17. Respiratory areas of carapace.
Fig. 18. Maxilliped.
Fig. 19. Fourth swimming leg.



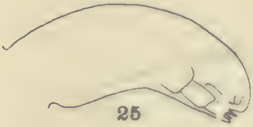
23



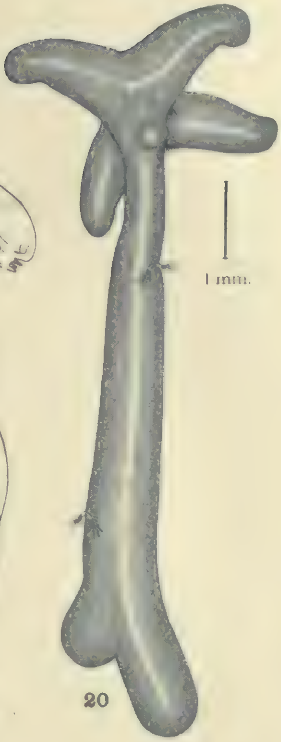
27



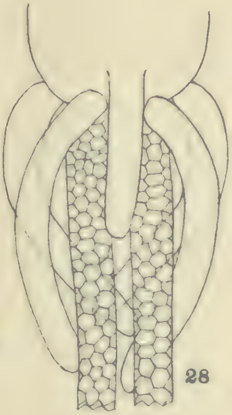
26



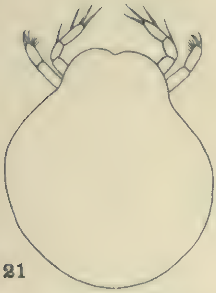
25



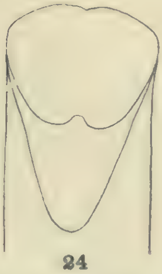
20



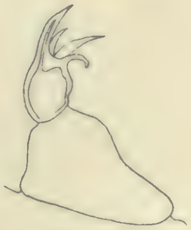
28



21



24



22

The Females of *Lernæa haplocephala* and *Brachiella macrura*

Fig. 20. Side view of female of *L. haplocephala*.
Fig. 21. Dorsal view of head showing first and second antennæ.
Fig. 22. Maxilla.
Fig. 23. Side view of female of *B. macrura*.
Fig. 24. Dorsal view of head showing carapace.
Fig. 25. Second antenna.
Fig. 26. Maxilla.
Fig. 27. Maxilliped.
Fig. 28. Ventral view, showing genital and posterior processes.

59.57, 71 (67.5)

Article II.—TIPULIDÆ COLLECTED BY THE AMERICAN MUSEUM CONGO EXPEDITION[1]

BY CHARLES P. ALEXANDER, PH.D.

PLATE IV

The crane-flies collected in the Belgian Congo by Messrs. Lang, Chapin, and Bequaert were kindly submitted to me for determination by Dr. Frank E. Lutz. The few specimens included represent only large and rather conspicuous forms but some of these were of exceptional interest. The number of species in the collection is seven, distributed in five genera. Our knowledge of the Tipulidæ of the Congo is almost nil, and further collections will be awaited with considerable interest and anticipation.

The crane-fly fauna of the Ethiopian region exhibits some interesting features that I have endeavored to summarize in the appended table. The family Tanyderidæ and the Cylindrotominæ and Pediciini of the Tipulidæ have not been recorded as yet from Africa or its islands, and the Ptychopteridæ are represented only by a single *Ptychoptera* from the Cape. The Limnobiini (*Dicranomyia*, *Libnotes*), Eriopterini (*Erioptera*, *Molophilus*, *Trentepohlia*, *Gonomyia*), and Hexatomini (*Limnophila*) are well represented in species. The Tipulinæ, likewise, are common and include a few curious endemic types. Genera that abound in the American tropics and in the Orient (*Geranomyia*, *Eriocera*) are here represented by few species. Still others that, in the Neotropical region occur in a variety of forms are here indicated only by a few, often non-typical, species (*Rhipidia*, *Teucholabis*, *Gnophomyia*).

The apparent centers of distribution of some of the genera are indicated by the abbreviations, as follows: E = Ethiopian; H = Holarctic; N = Neotropic; Nea = Nearctic; O = Oriental; P = Palearctic; A = Australasian; * = doubtful genera.

I. Cosmopolitan, or nearly so; representatives occurring in most of the faunal regions of the world.

Ptychoptera (H)
Dicranomyia
Geranomyia (N)
Subg. *Empeda* (H)
Molophilus (H)
Gonomyia (H)

---

[1] Scientific results of The American Museum of Natural History Congo Expedition. Entomology No. 3.

Rhamphidia (A)
Limnophila (H)
Eriocera (N)
Elephantomyia
Orimarga (N)
Erioptera
Subg. *Leiponeura* (N)
Subg. *Gonomyella* (N)
Trimicra
Longurio (E)
Tipula (H)
Nephrotoma (H)

II. Tropicopolitan.
Styringomyia (E, O)
Trentepohlia (O)
Megistocera (E)

III. Oriental and Ethiopian; especially southern and eastern Africa.
Thrypticomyia (O)
Libnotes (O)
Conosia (O)
Scamboneura (O)
*Tipulodina**
Ctenacroscelis (O)

IV. Neotropical and Ethiopian.
Ceratocheilus
Lecteria

V. Center of Distribution in the Australasian region.
Tasiocera
Habromastix
Dolichopeza

VI. Center of Distribution in the Neotropical region.
Rhipidia
Teucholabis
Atarba
Toxorhina
Gnophomyia

VII. Center of Distribution in the Holarctic or Palearctic region.
Limnobia (H)
Adelphomyia * (H)
Hexatoma (P)
Ormosia * (H)
Orimargula (*H*)

VIII. Endemic (South Africa).
Platylimnobia
Podoneura
Leptotipula
Idiotipula

The types of the new species described in this paper are deposited in the collection of The American Museum of Natural History. Paratypes of *Lecteria africana* are in the author's collection.

TIPULIDÆ

Limnobiinæ

LIMNOBIA Meigen

Limnobia MEIGEN, 1818, System. Beschr., I, p. 92.

Limnobia congoensis, new species

Plate IV, Figure 1

Thorax shiny black and yellowish, the pro- and metapleura yellow; halteres dark, pale at the base; legs dark; wings yellow, the outer margin broadly infumed with darker, the veins narrowly seamed with dark brown; abdomen black, the hypopygial region yellowish.

Female (?).—Length, about 10.2 mm.; wing, 12.6 mm.

Rostrum and palpi dark brown, the latter short. Antennæ brownish yellow, the scape above dark brown; flagellar segments oval, each with a very long bristle. Eyes large, the space on the vertex between them very narrow but little wider than the diameter of the first antennal segment. Head brownish yellow, the area surrounding the insertion of the antennæ brown.

Pronotum dull yellow, above on the mid-line narrowly dark brown. Mesonotal prescutum shiny; the usual three stripes very broad, black, entirely confluent behind; the space anterior to and behind the lateral stripes yellowish. Scutal lobes black, the median area paler; scutellum light yellow; postnotum black. Pleura variegated yellowish and black; propleura, including the coxæ of the fore legs, deep yellowish; mesopleura, including the coxæ of the middle legs, black, excepting a restricted dull yellowish area below the wing-root; metapleura, including the base of the halteres, pale yellowish, continued onto the mesosternum between the middle and hind coxæ. Halteres dark brown, except the basal third of the stem which is conspicuously light yellow. Legs with the coxæ as described above, the hind coxæ black; posterior trochanters blackish, anterior trochanters reddish; femora dark brown, most intense apically; tibiæ brown; tarsi dark brown. Wings with a strong yellow tinge, the apical region and the posterior margin tinged with brown; stigma dark brown, solid; narrow, dark brown seams along the cord and the longitudinal veins, more conspicuous along *Cu*. Venation: *Sc* terminating opposite the end of the sector; *r* at the tip of R_1; *Rs* moderately elongated, a little longer than cell *1st* M_2, angulated and slightly spurred at the origin; basal deflection of Cu_1 at the fork of *M*.

Abdomen black, the hypopygium and the sclerites immediately basad of it orange-yellow. The tip of the abdomen of the unique type is slightly injured and I cannot determine the sex with certainty but believe that it is a female. The very narrow vertex suggests that the specimen may be a male.

Habitat.—Belgian Congo.

Holotype.— ♀ (?); Medje, 27° 30′ E., 2° 25′ N.; Sept. 15-30, 1910. (Lang and Chapin Coll.)

This is a true member of the genus *Limnobia* and perhaps the first to be described from the Ethiopian region although *L. uniflava* Riedel may correctly be referred here. The present species bears a slight resemblance to forms like *L. indigena* Osten Sacken, etc.

The rather numerous species referred to this genus by Bergroth, Speiser, Edwards, and others seem rather to be referable to *Dicranomyia, Rhipidia* and *Libnotes.* Dr. Bergroth has written several important papers and notes on tipulid synonymy. While admitting many of these points, there are others to which I can by no means agree and it seems opportune to speak of one of these now. In his latest paper on the subject ('Some Tipulid Synonymy,' Psyche, XXII, pp. 54–59, April 1915) Dr. Bergroth, in speaking of the genera *Limnobia* and *Dicranomyia,* writes as follows: "Alexander's conception of these two genera seems to be so different from that of Osten Sacken and all other authors that an explanation of how he distinguishes them is much to be desired."

On the contrary, I maintain that my conception of the limits of *Dicranomyia* corresponds very closely with that of Osten Sacken, and that it is Bergroth and some other European writers who deviate from that definition. The most important single feature entering into this discussion concerns the relative length of the subcostal vein, it being long and extending far beyond the origin of the sector in *Limnobia,* but short and ending about opposite or before the origin of the sector in *most* species of *Dicranomyia.* Dr. Bergroth has apparently overlooked the group of species in the genus *Dicranomyia* (Osten Sacken, 1869, Monogr., Smithsonian Miscell. Coll., No. 219, pp. 73–76) in which the subcosta is fully as long as in *Limnobia.* The species included by Osten Sacken, *D. pubipennis, D. globithorax, D. rara,* and *D. simulans,* are from eastern America, but species in the same category are found in practically all parts of the world where the genus occurs. In some countries they are more abundant than the species with the short subcosta, but in the Holarctic region are generally very much less common. The species that Dr. Bergroth would place in *Limnobia* (*D. nebulosa, eiseni, gloriosa,* etc.) are quite comparable to the four species listed above. In Europe, *D. pilipennis* Egger, which is apparently the same as, or very closely related to, *D. pubipennis,* is a common species and must be entirely familiar to Dr. Bergroth, and yet I believe he would hesitate to refer it to *Limnobia,* in spite of the length of its subcostal vein.

The American students of the Tipulidæ seem to have less difficulty in reconciling the group of species with the long subcosta, as discussed above, to the genus *Dicranomyia*, but among the European workers several take a stand similar to that of Dr. Bergroth, especially Edwards and Speiser. DeMeijere described his *D. umbrata* (Java) with a long subcosta and correctly referred it to *Dicranomyia*, yet Edwards later referred it to the genus *Limnobia*. Brunetti describes a variety of forms as species of *Limnobia;* those with a short subcosta (*tinctinervis, festiva*) are undoubted species of *Dicranomyia*, while his *L. indica* with the subcosta long is, in my opinion, possibly a *Dicranomyia; L. longinervis*, on the other hand, is evidently a *Libnotes*. One of Bergroth's species, *D. venusta*, of western North America, exhibits a marked variability in the length of the subcosta, ranging from specimens where the vein ends opposite the origin of the sector, to others where it extends notably beyond. The question arises: is this a *Dicranomyia* or a *Limnobia*, in the sense of Bergroth? Indeed, what is apparently the same, or a very closely related, species was described later on by Dr. Williston as *Limnobia concinna*.

I have stated elsewhere, and maintain again, that when the fauna of the world is considered, the only characters that are available for distinguishing *Limnobia* from *Dicranomyia* are so slight as to be difficult of definition, yet perceptible. In such cases the student has to depend largely on the habitus of the species concerned. This, of course, brings in intuition and the personal opinion of the authority, but the only other course left is to refer all of these genera, *Dicranomyia*, *Rhipidia*, *Peripheroptera*, *Dapanoptera*, *Goniodineura*, *Libnotes*, etc., to *Limnobia*. A somewhat similar condition obtains in the Eriopterini, and here Dr. Bergroth has deplored the possibility of lumping the complex into one or few genera. I, likewise, believe that this is to be done only as a last resort. The constant accession of exotic Tipulidæ has by no means eased the burden of the taxonomist and the difficulty of exactly defining genera is even greater than it was a half century ago, at the time of the appearance of Osten Sacken's monograph. Recently the writer has undertaken a study of the immature stages of the Tipulidæ and related families. Representatives of over seventy species, including forty genera and all the tribes and major groups, have been obtained. A careful study of this material has thrown much light on the subject of classification, and it seems that its continuance will do much toward solving the problem. The results of this study will appear in another paper.

LECTERIA Osten Sacken

Lecteria OSTEN SACKEN, 1887, Berliner Ent. Zeitschr., XXXI, part 2, p. 206.

Lecteria africana, new species

Plate IV, Figure 2

Coloration brownish yellow or brownish gray, the mesonotal prescutum with narrow, indistinct stripes; pseudosutural foveæ conspicuous; legs reddish brown with the tips of the segments darker; wings pale yellow, deepest along the costa; pale gray and dark brown spots at the forks and tips of many of the veins; abdomen very elongate, reddish brown.

Male.—Length, 29–30 mm.; wing, 22–23 mm.; abdomen, 24 mm.; hind leg, femur, 13.3 mm.; tibia, 12.4 mm.; tarsus, 11.2 mm.

Rostrum and palpi dark brown. Antennæ with the first scapal segment dark brown, faintly gray pruinose; second segment brown; flagellum pale brownish yellow; first scapal segment elongate, as long as the succeeding three taken together; basal flagellar segments rounded or oval, beyond the fourth elongate-oval with long, delicate verticils. Head with the eyes large, protuberant; vertex moderate in width; head strongly narrowed behind, light brownish gray with delicate transverse lines; an indistinct narrow, median longitudinal stripe.

Mesonotum large. Prescutum brownish yellow, sometimes slightly grayish, with three indistinct stripes that are narrowly and indistinctly margined with darker; the middle stripe is bisected by a narrow dark brown stripe; pseudosutural foveæ large, subreniform, dark brown; scutum yellow or slightly grayish, the lobes a little darker medially; scutellum small, brownish yellow, narrowly brown medially, with numerous long yellow hairs; postnotum grayish yellow with a narrow dark brown median stripe. Pleura brownish gray. Halteres brown, the knobs darker. Legs with the coxæ brownish gray; trochanters brown; femora and tibiæ reddish brown, the tips narrowly dark brown; two basal segments of the tarsi reddish tipped with dark; apical tarsal segments dark brown; tibiæ unarmed. Wings pale yellow, the costal region more intensely yellow; small dark brown seams at r, Sc_2, base of R_{4+5} and base of Rs; paler brown seams at the tip of R_2, fork of M_{1+2} and less indistinctly at the ends of most of the longitudinal veins and along Cu. Venation: Sc very long, almost as long as R; Rs very long, greatly arcuated at its origin and running very close to R_1, even more than is usual in the genus; basal deflection of R_{4+5} short, strongly arcuated; R_2 long, strongly upcurved at the tip; r inserted on R_2 near its base and on R_1 a short distance from the tip; cell *1st* M_2 elongate, irregularly hexagonal; petiole of cell M_1 a little longer than this cell; fusion of M_3 and Cu_1 slight.

Abdomen very long, reddish brown, the lateral margins of the tergites narrowly dark brown; seventh tergite with a narrow brown or black median stripe; abdominal segments with numerous yellow setæ; a narrow basal ring on either side destitute of setæ.

Habitat.—Belgian Congo.

Holotype.—♂; Faradje, 29° 40′ E., 3° 40′ N.; January 1913. (Lang and Chapin Coll.)

Paratopotypes.—♂♂; January 1913 and April 1911.

Paratype.—♂; Bagboro, 29″ E., 4° 18′ N.; October 16, 1911.

The hitherto known species of this genus are Neotropical but the occurrence of undescribed forms in Africa was mentioned by the writer some years ago (1913, Proc. U. S. Nat. Mus., XLIV, p. 493). The resemblance of *L. africana* to species of the tropical American genus *Psaronius* Enderlein and especially to the genotype, *P. obscurus* (Fabricius), isstriking and difficult of explanation. In the paper just cited I expressed the belief that the two genera are confluent but they seem to be readily separable, the species of *Psaronius* having very long tibial spurs while the tibiæ in *Lecteria* are entirely unarmed. The similarity in venation and general habitus is remarkable.

Tipulinæ

MEGISTOCERA Wiedemann

Megistocera WIEDEMANN, 1828, Aussereur. Zweifl. Ins., I, p. 55.

Megistocera bicauda Speiser

Megistocera bicauda SPEISER, 1909, in Sjöstedt's Kilimandjaro-Meru Exped., II, part 10, pp. 53 and 54. Type locality: Mombo in Usambara.

A single female that agrees well with Speiser's description, except as to the color of the abdomen, which is dark brown above, the basal tergites with a rather bright yellowish brown median stripe which becomes obsolete about the fourth segment.

Belgian Congo: Stanleville, 25° 15′ E., 0° 30′ N.; February 1915. (Lang and Chapin Coll.)

TIPULA Linnæus[1]

Tipula LINNÆUS, 1758, Syst. Nat., 10th Ed., p. 585.

Tipula dolichopezoides, new subspecies

Plate IV, Figure 3

General coloration dark brown, the prescutum without distinct stripes; pleura yellow with indistinct brownish blotches; legs dark brown; wings with a brown tinge, most intense along the anterior margin to beyond the wing apex; a pale area before and beyond the stigma and in cell *1st* M_2; cell *1st* M_2 small, pentagonal; abdomen banded brown and yellow.

Female.—Length, about 12 mm.; wing, 11.8 mm.; middle leg, femur, 8.3 mm.; tibia, 9 mm.; hind leg, femur, 8.6 mm.; tibia, 8.7 mm.

---

[1] **Tipula brunettiana**, new name for *Tipula splendens* BRUNETTI, 1912, Fauna British India, Diptera, p. 314 (India); *non Tipula splendens* DOANE, 1901, Journ. N. Y. Ent. Soc., p 107 (United States).

Frontal prolongation of the head short, brownish yellow above, the sides darker brown; nasus represented only by a few stout hairs. Palpi moderately elongated, dark brown, paler at the joints. Antennæ with the scape light yellow; first flagellar segment elongate, yellow; remaining segments brown, the basal portion a little darker; flagellum with long verticils. Head broad behind, dark brown, the front and the anterior portion of the vertex yellowish.

Mesonotum dark brown without distinct stripes; abundant long black hairs on the interspaces. Pleura dull yellow, indistinctly marked with brown, the mesopleura largely dark; a dark area on the mesosternum between the middle and hind coxæ. Halteres slender, dark brown, the extreme base and apex paler. Legs with the coxæ and trochanters yellow; remainder of the legs dark brown. Wings with a slight brown tinge; the costal region, including the wing apex, dark brown; broad brown seams along the cord and less distinctly along the longitudinal veins; a pale obliterative area before and beyond the oval dark brown stigma and another completely filling the small cell *1st* M_2. Venation: *Rs* short, gently arcuated, only a little longer than R_{2+3}; R_2 long, persistent, bisecting the outer obliterative area; cell *1st* M_2 very small, pentagonal; cell M_1 long-petiolate, the petiole about equal to R_{2+3}; fusion of Cu_1 and M_{3+4} rather extensive, beginning at the fork of *M*.

Abdominal tergites dark brown, excepting the broad basal and lateral margins. Sternites yellow, the segments with the posterior margin rather broadly ringed with brown; a narrow sub-basal transverse band of brown. Female ovipositor rather large, with a long dorsal basal shield, castaneous; the tergal valves elongate, slender, divergent apically, with the tips rounded; sternal valves a little shorter, compressed, the tips subacute.

Habitat.—Belgian Congo.

Holotype.—♀; Stanleyville, 25° 15′ E., 0° 30′ N.; February 1915. (Lang and Chapin Coll.)

This small species curiously suggests the genus *Oropeza* Needham, but is apparently a true *Tipula*. Its resemblance to certain African species of *Dolichopeza*, belonging to the subgenus *Trichodolichopeza* Alexander, is also noteworthy.

Tipula langi, new species

Plate IV, Figure 4

General coloration dark brown; pronotal scutum narrow and very high; a rounded dark brown spot on the margin of the prescutum at about mid-length; scutellum yellow; wings brownish gray, a brown seam along *r-m* and the basal deflection of Cu_1; abdomen reddish brown, with a dark brown lateral stripe.

Female.—Length, about 18.5 mm.; wing, 19.5 mm.

Frontal prolongation of the head elongate, dark brown above, paler, reddish yellow on the sides; nasus elongate, slender; palpi dark brown. Antennæ with the scape brown; first flagellar segment elongate, dark brown, the base a little paler; remainder of the flagellum broken. Head dark brown.

Pronotum dark brown, the scutum highly projecting. Mesonotal prescutum yellowish brown, brighter anteriorly; a narrow indistinct median brown line; a rounded blackish spot on the lateral margin of the prescutum at about mid-length and just behind the pseudosutural foveæ; scutum dark blackish brown, the centers of the lobes yellowish brown; scutellum yellowish brown; postnotum similar, the basal third dark brown. Pleura dull yellowish brown, the region near the anterior spiracle more cinereous; a dark brownish black area on the lateral regions of the postnotum behind the wing-root. Halteres elongate, dark brown, the knobs brighter reddish. Legs with the coxæ and trochanters dull yellowish; femora and tibiæ reddish brown, the tips dark brown; tarsi dark brown. Wings with a strong brownish gray tinge, the costal region more brownish; stigma dark brown, narrow; a narrow brown seam along *r–m* and the basal deflection of Cu_1. Venation: *Rs* shorter than R_{2+3}; R_2 present but weak and cell R_2 consequently small and with its inner end acute; R_3 short, straight; cell *1st* M_2 large, ample.

Abdominal tergites reddish brown, a little brighter basally; lateral margins of the segments broadly blackish, producing a dark lateral stripe; an indistinct blackish median spot near the base of the segments; sternites yellowish. Female ovipositor with the tergal valves very long and slender, the inner margin at the base fringed with long hairs; sternal valves short, compressed, pale yellow, the tips broadly rounded.

Habitat.—Belgian Congo.

Holotype.—♀; Avakubi, 27° 40′ E., 1° 20′ N.; Oct. 4–8, 1909. (Lang and Chapin Coll.)

This species is closest to *T. jocosa* Alexander (Cape Colony) in the peculiar venation, but cell R_2 is smaller and with its inner end even more acute, while cell *1st* M_2 is comparatively small.

Tipula langi rubricapilla, new subspecies

Female.—Length, 18 mm.; wing, 17 mm.

Differs from the typical *langi* as follows: the head is much brighter in color, reddish, as is also the dorsal shield of the ovipositor. The flagellum is brownish black, the segments rather elongated and with long verticils. The high pronotal scutum is broadly yellow medially, the sides dark brown, the mesonotum largely dark, but the scutellum is entirely yellow. Pleura yellowish, with extensive dark brown markings including the propleura, most of the mesopleura and the outer face of the coxæ. Abdomen dark brown, especially on the sternites.

Habitat.—Belgian Congo.

Holotype.—♀; Medje, 27° 30′ E., 2° 25′ N.; Sept. 1–7, 1910. (Lang and Chapin Coll.)

Pupa of *Tipula* Species

A large tipuline pupa was secured by Dr. Joseph Bequaert in the Butagu Valley at 2200 meters, western slope of Mt. Ruwenzori. The specimen was taken in April 1914 from wet moss near a brook. There can be little doubt but that the specimen belongs to a large species of the restricted genus *Tipula* Linnæus but any further determination is impossible at this time. The fly that would emerge from this pupa would be almost as large as *Tipula abdominalis* (Say) of northeastern North America. It would naturally be expected that this might be the pupa of the large and vigorous *Ctenacroscelis albovittatus* (Macquart) which has an extensive range in eastern Africa, but the venation of the wing-pad precludes this reference. This specimen may be briefly described as follows:

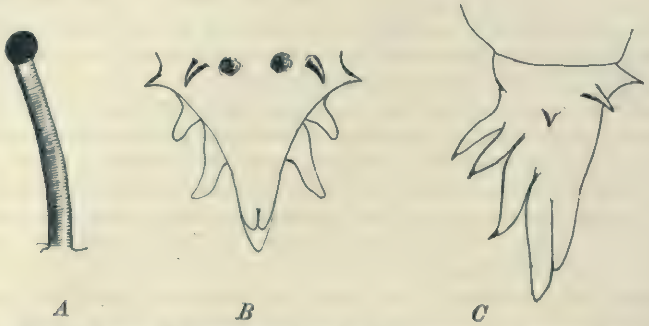


Fig. 1. Details of pupa of *Tipula* species from Mt. Ruwenzori. *A*, pronotal horn; *B*, ventral aspect of the caudal end; *C*, lateral aspect of the caudal end.

Pupa.—Length, 37 mm.
Width, dextro-sinistral, at the wing-pad, 5.2 mm.
Depth, dorso-ventral, at the wing-pad, 5.3 mm.
Pronotal breathing horn, 2.5 mm.

Coloration of the alcholic pupa very dark reddish brown. The specimen was evidently nearly ready to emerge when it was killed.

Labral sheath very broad, transversely wrinkled Sheaths of the maxillary palpi strongly recurved at their tips. Pronotal breathing-horns short, equal in length, cylindrical, the tips slightly expanded (Fig. 1*A*). The mesonotum is expansive, with about eight prominent but depressed tubercles, the anterior four of which extend across the dorsum in a semicircular transverse row; the outermost pair are located just above the root of the wing. Wing-sheaths showing the venation clearly, vein R_2 not dipping strongly toward vein R_3; cell M_1 petiolate; vein *m-cu* short or punctiform. Wing-sheaths reaching the base of the third abdominal segment. Leg-sheaths attaining the base of the fourth abdominal segment the fore tarsal sheaths shorter than the other legs.

Abdominal tergites with a row of twelve small spines across the caudal margin of the posterior ring, on either side of the median line with an additional slightly larger spine grouped close to two of the series to form a close triangle. Pleurites with a large spine on the anterior ring and two small spines placed side by side on the posterior ring. Abdominal sternites with about eleven spines on the posterior ring, the two outermost on either end of the row small and paired; two widely separated larger spines on the basal half of the posterior ring. Female cauda surrounded by ten powerful spines, four being on the sternum of the eighth segment, two on the pleura of the eighth segment and four larger spines, set close together, located at the base of the ninth tergum (Fig. 1 *B* and *C*). In addition to the four tergal spines there is an additional long, powerful lobe on either side at the base of the tergal valves, these directed caudad and slightly dorsad. Tergal valves of the ovipositor considerably longer than the sternal valves.

Specimen in the collection of the American Museum.

NEPHROTOMA Meigen

Nephrotoma MEIGEN, 1803, Illiger's Mag., II, p. 262.

Nephrotoma chapini, new species

Plate IV, Figure 5

Head orange-yellow, including the frontal prolongation; no dark occipital mark; mesonotum dull yellow with three broad black stripes; scutellum and postnotum yellow, the apical third of the latter black; pleura yellow, spotted with brown; wings brownish yellow, the cord indistinctly seamed with brown; abdomen yellow, transversely banded with black.

Female.—Length, 15 mm.; wing, 12.4 mm.

Frontal prolongation of the head very short, yellow; nasus short with a tuft of long black hair; palpi dark brown. Antennæ with the first segment yellow; second segment dark brown; flagellum very dark brown. Head rich orange-yellow, duller on the genæ; vertical tubercle rather prominent; no shiny area on occiput.

Pronotum broadly yellow, the sides dark brownish black. Mesonotum dull yellow with three very broad black stripes that are almost confluent behind, separated only by a very indistinct line of chestnut brown; the space before the lateral stripe triangular, dull yellow; scutum almost entirely black, the median area paler; scutellum dull brownish yellow, the sides darker; postnotum yellow, the apical third dark brownish black. Pleura yellow, the mesepimeron paler, almost whitish; a large brown spot on the mesepisternum and another on the mesosternum, suffusing the base of the middle coxæ. Halteres dark brown, the extreme base and the knobs a little paler. Legs with the coxæ more or less infumed with brown, darkest on the posterior coxæ, which are almost entirely of that color; trochanters dull yellow; femora black, the basal portion yellowish, this narrowest on the fore femora, broadest on the hind femora; tibiæ and tarsi black. Wings with a strong grayish yellow tinge, costal area a little brighter; stigma brown; the cord and the longitudinal veins indistinctly seamed with very pale brown. Venation: *Rs* very short, scarcely longer than the basal deflection of R_{4+5}; cell M_1 broadly sessile.

Abdominal tergites banded black and yellow, the first tergite and the apical half of segments two to four black, the apical two-thirds of segment five black; all of segment six black except a small yellow spot on the sides at the base; segment seven entirely black; segment eight yellow, margined with black; segment nine yellow; ovipositor chestnut; lateral margins of the tergites broadly dark brownish black; sternites approximately similar to the tergites.

Habitat.—Belgian Congo.

Holotype.— ♀; Stanleyville, 25° 15′ E., 0° 30′ N.; February 1915. (Lang and Chapin Coll.)

In its banded abdomen this species suggests *N. tigrina* Alexander of Portuguese East Africa (1917, Ann. South African Mus., XVII, pp. 177–179) but in other respects there is not a great resemblance between the two.

Nephrotoma ruwenzoriana, new species

Plate IV, Figure 6

Head orange-yellow, the frontal prolongation black above; thorax entirely blue-black except the basal two-thirds of the postnotum which are orange-yellow; halteres and legs black; wings strongly infumed with blackish; abdomen black with only the last segment reddish.

Female.—Length, 17.5 mm.; wing, 12.8 mm.

Frontal prolongation of the head short, jet black above, reddish yellow on the sides; nasus long, slender, black; palpi short, black. Antennæ with the first segment brownish orange; second segment brown; flagellar segments black. Head orange-yellow, the occiput with a brown triangular mark that runs forward onto the vertex.

Pronotum very dark reddish brown; mesonotum entirely deep blue-black with only the basal two-thirds of the postnotum bright yellow. Pleura blue-black. Halteres and legs black. Wings broad, strongly tinged with blackish, especially along the costal region and on the basal third, whence it is continued outward along veins *Cu* and *2nd A;* stigma dark brown; tip of the wing darkened, a broad seam along the cord. Venation: *Rs* short, straight, oblique; cell M_1 rather narrowly sessile.

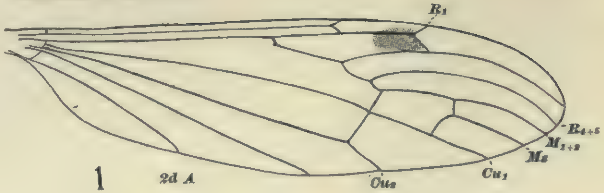
Abdomen entirely blue-black, with the exception of the ninth segment and the valves of the ovipositor, which are yellowish chestnut.

Habitat.—Belgian Congo.

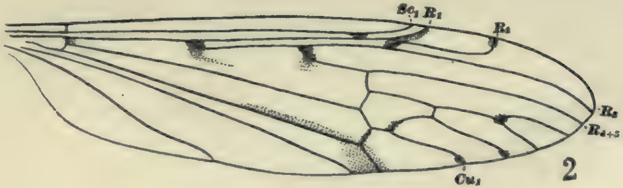
Holotype.—♀; Mt. Ruwenzori, 29° 50′ E., 0° 30′ N., on the western slope in the Butagu Valley at 3000 m.; April 15, 1914. (J. Bequaert Coll.)

Most closely related to *N. fuscipennis* (Karsch) from Portuguese West Africa (1886, Ent. Nachricht., XII, pp. 52 and 53). The two species may be separated by the following key:

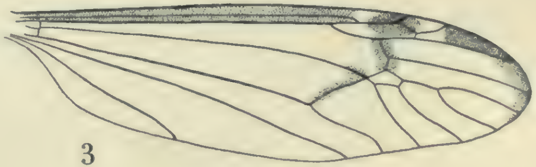
1. Female with the scutellum yellowish red; a yellow spot on pleura above the middle coxæ; second and third abdominal segments more or less yellowish red.......................................*N. fuscipennis* (Karsch).
   Female with the scutellum black; pleura and abdomen uniformly blue-black.................................*N. ruwenzoriana*, new species.


R1
R4+5
M1+2
M3
Cu1
Cu2
2d A

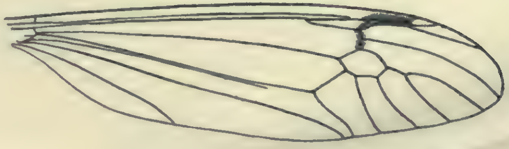
1


Sc1 R1
R1
R3
R4+5
Cu1

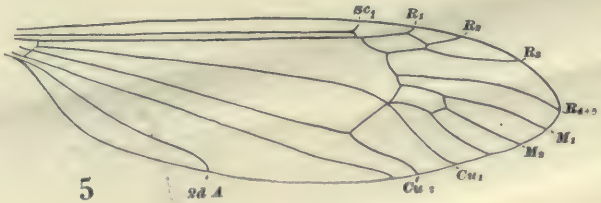
2



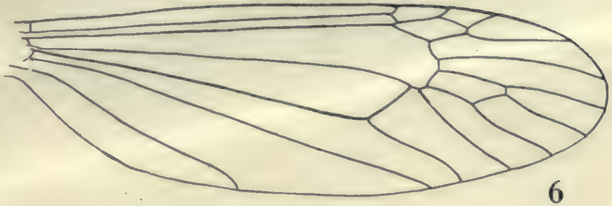
3



4


Sc1
R1
R2
R3
R4+5
M1
M3
Cu1
Cu2
2d A

5



6

Sc = Subcosta; *R* = Radius; *M* = Media; *Cu* = Cubitus; *A* = Anal veins (Comstock-Needham System).

Fig. 1. Wing of *Limnobia congoensis*, new species.
Fig. 2. Wing of *Lecteria africana*, new species.
Fig. 3. Wing of *Tipula dolichopezoides*, new species.
Fig. 4. Wing of *Tipula langi*, new species.
Fig. 5. Wing of *Nephrotoma chapini*, new species.
Fig. 6. Wing of *Nephrotoma ruwenzoriana*, new species.

59.57,4 (67.5)

Article III.—NEUROPTERA, PANORPATA, AND TRICHOPTERA COLLECTED BY THE AMERICAN MUSEUM CONGO EXPEDITION, WITH LISTS OF THE SPECIES KNOWN FROM THE BELGIAN CONGO[1]

By Nathan Banks

The collections brought from the Congo by Messrs. Lang and Chapin contain nineteen species of true Neuroptera, one of Panorpata, and five of Trichoptera. Many of these forms are widely distributed in tropical Africa, but the collection, small as it is, adds several species to the fauna of the Belgian Congo. A list of the Congo species hitherto known from the three orders here considered has been compiled by Dr. J. Bequaert and incorporated in the paper. While the neuropterous fauna of that country is too incompletely known to give much information with regard to its affinities, yet the occurrence of several forms from southern Abyssinia in the extreme northeastern Congo Basin, as shown by this collection, is noteworthy.

Approximate Location of Places Mentioned in this Paper[2]

Barumbu.—1° 10′ N., 23° 20′ E.
Beni.—0° 30′ N., 29° 30′ E.
Bumba.—2° 10′ N., 22° 30′ E.
Faradje.—3° 40′ N., 29° 40′ E.
Garamba.—4° 10′ N., 29° 40′ E.
Kabare.—0° 35′ S., 29° 30′ E.
Kasindi.—0°, 29° 40′ E.
Lisala.—2° 10′ N., 21° 30′ E.
Matadi.—5° 50′ S., 13° 35′ E.
Medje.—2° 25′ N., 27° 30′ E.
Niangara.—3° 40′ N., 27° 50′ E.
Rungu.—3° N., 28° E.
Rutshuru.—1° 15′ S., 29° 30′ E.
Stanleyville.—0° 30′ N., 25° 15′ E.

NEUROPTERA

Myrmeleonidæ

Palpares Rambur

1. **Palpares hamatus** Kolbe

Palpares hamatus Kolbe, 1898, Entom. Zeitg. Stettin, LIX, p. 232.

Twenty-four specimens: Faradje, November 1912; Niangara, November 1910; Rungu, October 1910.

Not previously recorded from the Belgian Congo.—Described from Abyssinia. According to P. Esben-Petersen, 1916, Ark. f. Zool., X, No. 15, p. 10, this is a synonym of *P. tigris* Dalman; if the other synonymy proposed by that author prove correct, the species has a wide distribution on the African continent. Navás' genus *Nosa* (1911, Rev. Zool. Afric., I, p. 239) is based on a specimen of this species.

---

[1] Scientific Results of the Congo Expedition. Entomology, No. 4.

[2] Most of these localities are shown on the map accompanying the reports on Congo Vespidæ (1918, Bull. Amer. Mus. Nat. Hist., XXXIX, p. 9) and on land mollusks (1919, Bull. Amer. Mus. Nat. Hist., XL, p. 13).

2. **Palpares abyssinicus** Kolbe

Palpares abyssinicus Kolbe, 1898, Entom. Zeitg. Stettin, LIX, p. 233.

Six specimens: Barumbu, July 1909; Niangara, November 1910; Faradje, December 1910.

Not previously recorded from the Belgian Congo.—Abyssinia, Eritrea.

3. **Palpares latro** Navás

Palpares latro Navás, 1911, Rev. Zoolog. Afric., I, p. 238, Pl. xvi, fig 3.

One specimen: Niangara, April 1913.

This species was described from a specimen without locality, probably from Central Africa; no other records of it have been published thus far. But, according to P. Esben-Petersen (1916, Ark. f. Zool., X, No. 15, p. 11), it is identical with *P. festivus* Gerstæcker.

Centroclisis Navás, 1909

(=*Sogra* Navás, 1912)

4. **Centroclisis mordax** (Navás)

Sogra mordax Navás, 1912, Mem. R. Ac. Cienc. Barcelona, (3) X, p. 151, fig. 7.

One specimen: Matadi, June 1915.

Not previously recorded from the Belgian Congo.—Described from German East Africa. According to P. Esben-Petersen (1916, Ark f. Zool., X, No. 15, p. 14) a synonym of *C. distincta* (Rambur) which has a wide range in Africa.

Myrmeleon Linné

5. **Myrmeleon obscurus** Rambur

Myrmeleon obscurus Rambur, 1842, Hist. Nat. Ins. Névroptères, p. 403.

One specimen: Stanleyville, March 1915.

Recorded from the Kasai (Lukombe, Dima), Manyema (Kibombo), and Katanga (Bukama).—A common species in tropical and South Africa.

Cueta Navás

6. **Cueta mysteriosa** (Gerstæcker)

Myrmeleon mysteriosus Gerstæcker, 1894, Mitth. naturw. Ver. Neu-Vorpommern, XXV (1893), p. 141.

One specimen: Niangara, April 1913.

Not previously recorded from the Belgian Congo.—German and British East Africa.

NEUROLEON Navás

7. **Neuroleon filiformis** (Gerstæcker)

Myrmeleon filiformis GERSTÆCKER, 1885, Mitth. naturw. Ver. Neu-Vorpommern, XVI, p. 31.

One specimen: Faradje, January 1913.

Not previously recorded from the Belgian Congo.—Sierra Leone, Cameroon, French Congo.

FORMICALEON Banks

8. **Formicaleon harpalyce** Banks

Formicaleon harpalyce BANKS, 1911, Ann. Entom. Soc. America, IV, p 17.

Four specimens: Niangara, November 1910; Faradje, December 1910.

Not previously recorded from the Belgian Congo.—Togo.

9. **Formicaleon turbidus** (Navás)

Formicaleo turbidus NAVÁS, 1915, Mem. Acc. Rom. Nuovi Lincei, XXXIII, p. 11.

Two specimens: Medje, March 1910; Stanleyville, March 1915.

Not previously recorded from the Belgian Congo.—Described from the Congo without more definite mention of locality; probably from the French Congo.

MACRONEMURUS Costa

10. **Macronemurus lepidus** Kolbe

Macronemurus lepidus KOLBE, 1898, Deutsch Ost Afr., IV, Netzflügler, p. 23.

Two specimens: Kabare, August 1914 (J. Bequaert Coll.); Faradje, December 1912.

Not previously recorded from the Belgian Congo.—German East Africa.

CREAGRIS Hagen

11. **Creagris nubifer** Kolbe

Creagris nubifer KOLBE, 1898, Deutsch Ost Afr., IV, Netzflügler, p. 25.

One specimen: between Beni and Kasindi, August 1914 (J. Bequaert Coll.).

Known from the northeastern Congo (Kinjawanga, north of Lake Albert Edward, a locality close to Beni) and Katanga (Bunkeya).—Togo, Abyssinia, German and British East Africa, South Africa.

12. **Creagris africana** (Rambur)

Myrmeleon africanus Rambur, 1842, Hist. Nat. Ins. Névroptères, p. 395.

Eleven specimens: Faradje, January 1913; Niangara, November 1910.

Not previously recorded from the Belgian Congo.—Widely distributed in Africa south of the Sahara.

CYMOTHALES Gerstæcker

13. **Cymothales johnstoni** Kirby

Cymothales johnstoni Kirby, 1902, in H. Johnston, The Uganda Protectorate, I, p. 469.

One specimen: Stanleyville, March 1915.

Not previously recorded from the Belgian Congo.—The species was known from Uganda (Entebbe) only.

This is the only specimen I have seen, except the type, with which it agrees closely. It is most nearly related to *C. dulcis* Gerstæcker, but is paler throughout.

Ascalaphidæ

TMESIBASIS MacLachlan

14. **Tmesibasis waelbroecki** van der Weele

Tmesibasis waelbroecki van der Weele, 1908, Cat. Coll. Zoolog. de Selys Longchamps, Fasc. 8, Ascalaphiden, p. 92, fig. 58.

Garamba, June 1912.

Known only from the Belgian Congo: Kinshasa.

HELICOMITUS MacLachlan

15. **Helicomitus festivus** (Rambur)

Bubo festivus Rambur, 1842, Hist. Nat. Ins. Névroptères, p. 356.

Three specimens: Niangara, November 1910; Faradje, November 1912.

Recorded from the Manyema (Kibombo, 245 kilom. south of Kindu), Uele (Bambili) and Katanga (Bukama, Watura-Katwe, Kapiri).—A common species in Africa from the Senegal and Egypt to Natal; also on Madagascar.

16. **Helicomitus rutilus** (Gerstæcker)

Suphalasca rutila GERSTÆCKER, 1894, Mitth. naturw. Ver. Neu-Vorpommern, XXV (1893), p. 105.

Two specimens: Faradje, December 1912.

Not previously recorded from the Belgian Congo, but doubtfully distinct from *H. festivus*, with which it is united by van der Weele (1908, Cat. Coll. Zoolog. de Selys Longchamps, Fasc. 8, p. 175).—German East Africa.

DISPAROMITUS van der Weele

17. **Disparomitus bacillus** (Gerstæcker)

Suphalasca bacillus GERSTÆCKER, 1885, Mitth. naturw. Ver. Neu-Vorpommern, XVI, p. 5.

Three specimens: Medje, April 1910.

Recorded from the Lower Congo (Congo da Lemba).—A West African species: Togo, Sierra Leone, Cameroon, French Congo.

Chrysopidæ

CHRYSOPA Leach

18. **Chrysopa bequaerti** Navás

Chrysopa bequaerti Navás, 1912, Rev. Zoolog. Afric., I, p. 409, fig. 4.

One specimen: Faradje, November 1912.

Known from the Belgian Congo only, where it is recorded in the Lower Congo (Kitobola) and Katanga (Kongolo).

NOTHOCHRYSA MacLachlan

19. **Nothochrysa rufostigma** (MacLachlan)

Chrysopa rufostigma MACLACHLAN, 1868, Journ. Linn. Soc. London, Zool., IX, p. 253.

One specimen: Faradje, November 1912.

Not previously recorded from the Belgian Congo.—South Africa.

NEUROPTERA RECORDED FROM THE BELGIAN CONGO

Myrmeleonidæ

PALPARES Rambur

Africa, Madeira, Southern Europe, Persia, India.
Palpares abyssinicus Kolbe. See above.
Palpares ægrotus Gerstæcker.—Congo (?)

Palpares bayeri Navás.—Northeastern Congo (Beni). Probably a synonym of *P. obsoletus* Gerstæcker.

Palpares cognatus Rambur.—Belgian Congo.

Palpares hamatus Kolbe. See above.

Palpares ictericus Navás.—Lower Congo (Kitobola). Probably a synonym of *P. ægrotus* Gerstæcker.

Palpares latipennis Rambur.—Lower Congo (Banana), between Leopoldville and Stanleyville.

Palpares latro Navás. See above.

Palpares nigrescens Navás.—Katanga (Sankisia).

Palpares normalis Navás.— Katanga.

Palpares obsoletus Gerstæcker.—Stanley Pool.

Palpares radiatus Rambur.—Congo (?).

Palpares stuhlmanni Kolbe.—Northeastern Congo (Vichumbi).

Palpares tigris Dalman.—Katanga (Punga, Sankisia). According to P. Esben-Petersen, *Nosa leonina* Navás was based on an aberrant specimen of the same species. See above.

PALPARELLUS Navás

Africa. P. Esben-Petersen (1916, *op. cit.*, p. 11) is of the opinion that this is not generically distinct from *Palpares*.

Palparellus obscuripennis (E. Schmidt).—Kasai, Katanga (Lusindoi).

HAGENOMYIA Banks

(=*Nelees* Navás)

Hagenomyia imperator (Navás).—Katanga (Kapiri).

Hagenomyia indistincta (Navás).—Katanga (Sankisia).

Hagenomyia lyncea (Fabricius).—Kasai (Lukombe).

Hagenomyia tristis (Hagen).—Lower Congo (Kunga, Leopoldville, Tchoa), Kasai (Lukombe), Katanga (Kongolo, Katwamba, Katolo, Kapiri, Shinsenda).

SYNGENES Kolbe

Syngenes longicornis (Rambur).—Congo (?).

CENTROCLISIS Navás

(including *Sogra* Navás).

Africa.

Centroclisis brachygaster (Rambur).—Lower Congo (Leopoldville), Kasai (Luluabourg).

Centroclisis lineatipennis (Peringuey).—Kasai (Hemptinne-St.-Benoît near Luluabourg).

Centroclisis mordax Navás. See above.

Centroclisis perversa (Navás).—Uele.

Centroclisis rufescens (Gerstæcker).—Lake Albert.

MYRMELEON Linné

Cosmopolitan.
Myrmeleon atlas Banks.—Northeastern Congo (Kwidjwi).
Myrmeleon lethifer Walker.—Northeastern Congo (Kwidjwi).
Myrmeleon obscurus Rambur. See above.
Myrmeleon simplicissimus Gerstæcker.—Katanga (Kapiri).

GYMNOLEON Banks

Africa.
Gymnoleon (?)*cognatus* Navás.—Katanga (Bukama).

GIBRELLA Navás

Africa.
Gibrella congolana Navás.—Katanga (Kapiri).

MACROLEON Banks

Macroleon polyzonus (Gerstæcker).—Equator (Busira).

CREAGRIS Hagen

Creagris africanus (Rambur). See above.
Creagris nubifer Kolbe. See above.

NETEJA Navás

Neteja sollicita Navás.—Katanga (Kapiri).

FORMICALEON Banks

Formicaleon harpalyce Banks. See above.
Formicaleon lethalis (Walker.—Kasai (Dima), Lake Leopold II, Katanga.
Formicaleon recurvus (Navás).—Kasai (Lodima).
Formicaleon scolius (Navás).—Lower Congo (Congo da Lemba).
Formicaleon turbidus (Navás). See above.
Formicaleon tholloni (Navás).—Kasai.

GRIALA Navás

Griala macilenta Navás.—Katanga (Kapiri).

NEMOLEON Navás

Nemoleon kituanus (Kolbe).—Northeastern Congo (Kwidjwi).

MACRONEMURUS Costa

Macronemurus interruptus Kolbe.—Northeastern Congo (Buginda).
Macronemurus iolanthe Banks.—Belgian Congo.
Macronemurus lepidus Kolbe. See above.

CYMOTHALES Gerstæcker

Africa, including Madagascar.
Cymothales congolensis Navás.—Katanga (Kapiri).
Cymothales delicatus Banks.—Congo (?).
Cymothales johnstoni Kirby. See above.
Cymothales liberiensis van der Weele.—Lower Congo (Lukula).
Cymothales mirabilis Gerstæcker.—Congo (?).

MOSSA Navás

Africa.
Mossa externa Navás.—Katanga (Bukama).

MAULA Navás

Africa.
Maula stigmatus Navás.—Katanga (Kalengwe).

CUETA Navás

Cueta cridai Navás.—Kasai.
Cueta mysteriosa (Gerstæcker.) See above.
Cueta punctatissima (Gerstæcker).—Katanga (Elisabethville).
Cueta styczynskii Navás.—Lower Congo (Boma).

NEUROLEON Navás

Neuroleon alcidice (Banks) (=*Creagris latens* Navás).—Lower Congo (Boma, Kitobola, Leopoldville), Katanga (Bukama).
Neuroleon filiformis (Gerstæcker). See above.

NYUTUS Navás

Nyutus lombardi Navás.—Lower Congo (Matadi).

BANYUTUS Navás

Banyutus acutus Navás.—Katanga (Katwamba, Kapiri, Lubumbashi River).
Banyutus insidiosus Navás.—Katanga (Katwamba, Kapiri).
Banyutus lethalis (Walker).—Katanga (Kasenga).
Banyutus maynei Navás.—Lower Congo (Malela).
Banyutus neuter Navás.—Katanga (Katolo).

Nemopteridæ

NEMOPISTHA Navás

Africa.
Nemopistha hennini Navás.—Belgian Congo; exact locality unknown.

Ascalaphidæ

ALLOCORMODES MacLachlan

Africa.

Allocormodes intractabilis (Walker).—Lower Congo (Lukula), Kwango (Popacabacca), Kasai (Kondue, Lodima).

TMESIBASIS MacLachlan

Africa.

Tmesibasis alberti Navás.—Katanga (Kasenga).

Tmesibasis waelbroecki van der Weele. See above.

SUHPALACSA Lefèbvre

Australia, Malayan Archipelago, West Africa.

Suhpalacsa haullevillei (Navás).—Kasai (Dima).

Suhpalacsa recondita (Navás).—Lower Congo (Malela).

Suhpalacsa subcostalis (Navás).—Kasai (Dima).

HELICOMITUS MacLachlan

Africa, Southern Asia.

Helicomitus (?) *bequaerti* Navás.—Katanga (Sankisia).

Helicomitus festivus (Rambur). See above.

NANOMITUS Navás

Africa.

Nanomitus sellatus Navás.—Katanga (Lukonzo).

DISPAROMITUS van der Weele

Africa.

Disparomitus bacillus (Gerstæcker). See above.

Disparomitus longus Navás.—Katanga (Kapiri).

NAGACTA Navás

Africa.

Nagacta leplaei Navás.—Katanga (Kapiri).

Nagacta schoutedeni Navás.—Katanga (Kapiri).

NEPHONEURA MacLachlan

Africa.

Nephoneura clavata Navás.—Katanga (Lukonzolwa).

ENCYOPOSIS MacLachlan

Africa.

Encyoposis hemistigma van der Weele.—Katanga (Sankisia).

Encyoposis nigrostigma Navás.—Northeastern Congo (Gangara between Dungu and Faradje).

PHALASCUSA Kolbe

Africa.
Phalascusa vassei van der Weele.—Katanga (Kasenga, Elisabethville).

DICOLPUS Gerstæcker

Tropical Africa.
Dicolpus volucris Gerstæcker.—Manyema (Nyangwe).

Osmylidæ

LYSMUS Navás

Lysmus leucomatodes Navás.—Congo (?).

Mantispidæ

NECYLA Navás

Necyla cercata Navás.—Katanga (Mufungwa-Sampwe).
Necyla perparva (Esben-Petersen).—Lower Congo (Boma).

MANTISPILLA Enderlein

Mantispilla umbripennis Navás.—Katanga (Elisabethville).

Hemerobiidæ

NOSYBUS Navás

Nosybus nobilis Navás.—Katanga (Bukama).

Chrysopidæ

CHRYSOPA Leach

Chrysopa bequaerti Navás. See above.
Chrysopa congrua Walker.—Lower Congo (Ganda Sundi).
Chrysopa ducissa Navás.—Katanga (Kapiri).

NOTHOCHRYSA MacLachlan

Nothochrysa rufostigma (MacLachlan). See above.
Nothochrysa temerata Navás.—Katanga (Kapiri).

PANORPATA

Bittacusidæ

BITTACUS Latreille

1. Bittacus weelei Esben-Petersen

Bittacus weelei ESBEN-PETERSEN, 1913, Rev. Zoolog. Afric., III, p. 142, figs. 7 and 8.

One specimen: Rutshuru, September 1914 (J. Bequaert Coll.).

Recorded from the Manyema (Kindu) and Katanga (Lubumbashi River) —German East Africa.

PANORPATA RECORDED FROM THE BELGIAN CONGO

Bittacusidæ

BITTACUS Latreille

Bittacus montanus van der Weele (*B. schoutedeni* Esben-Petersen).—Northeastern Congo (between Beni and Lesse), Katanga (Mufungwa), Manyema (Kindu, Vieux-Kassongo).

Bittacus pobeguini Navás.—Katanga (Kongolo).

Bittacus weelei Esben-Petersen. See above.

TRICHOPTERA

Polycentropidæ

DIPSEUDOPSIS Walker

1. Dipseudopsis fasciata Brauer

Dipseudopsis fasciata BRAUER, 1875, Verh. Zool. Bot. Ges. Wien, XXV, p. 69, Pl. IV, fig. 3.

Faradje, March and November 1912.

Recorded from various localities of the Belgian Congo: Lower Congo (Leopoldville), island of the Congo River at the confluence of the Ubangi River, Uele River.—Tropical Africa from the Senegal, Sudan and Abyssinia to Rhodesia and German East Africa.

Hydropsychidæ

HYDROPSYCHODES Ulmer

2. Hydropsychodes sexfasciata Ulmer

Hydropsychodes sexfasciata ULMER, 1904, Ark. f. Zool., I, p. 421, figs. 10–12.

Stanleyville, January to March 1915.

Recorded from the Aruwimi River (Banalia).—Cameroon, Belgian Congo.

ÆTHALOPTERA Brauer

3. Æthaloptera dispar Brauer

Æthaloptera dispar BRAUER, 1875, Verh. Zool. Bot. Ges. Wien, XXV, p. 72, Pl IV, figs. 4–4 *c*.

Matadi, June 24, 1909; Stanleyville, March 1915.

Lower Congo (Boma, Leopoldville, Kinshasa, Kwamouth), Middle Congo (Bolobo), Lake Albert Edward, Kwango (Popocabacca).—West Africa: Senegal, Cameroon, French Congo, Anglo-Egyptian Sudan, Belgian Congo.

POLYMORPHANISCUS Walker

4. **Polymorphaniscus bipunctatus** (Brauer)

Œstropsis bipunctata BRAUER, 1875, Verh. Zool. Bot. Ges. Wien, XXV, p. 73.

Bumba, May 15, 1915; Lisala, May 6, 1915.

Common in the Belgian Congo: Lower Congo (Kinshasa, Boma), Middle Congo (Irebu), Kasai, Bangala, Aruwimi (Basoko).—Tropical Africa from the Niger and Anglo-Egyptian Sudan to Natal.

PROTOMACRONEMA Ulmer

5. **Protomacronema hyalinum** Ulmer

Protomacronema hyalinum Ulmer, 1904, Zool. Anzeiger, XXVIII, p. 354, fig. 1.

Stanleyville, August 10, 1909.

Common in the Belgian Congo: Lower Congo (Boma, Kinshasa, Leopoldville), Equator (Ikelemba, Baringa), Bangala (Umangi).—French Congo.

TRICHOPTERA RECORDED FROM THE BELGIAN CONGO

Hydroptilidæ

CATOXYETHIRA Ulmer

Catoxyethira fasciata Ulmer.—Lower Congo (Kinshasa).

Polycentropidæ

NYCTIOPHYLAX Brauer

Nyctiophylax occidentalis Ulmer.—Lower Congo (Kinshasa).

PROTODIPSEUDOPSIS Ulmer

Protodipseudopsis sjæstedti Ulmer.—Congo.

DIPSEUDOPSIS Walker

Dipseudopsis africana Ulmer.—Belgian Congo.
Dipseudopsis fasciata Brauer. See above.
Dipseudopsis lata Ulmer. Kasai (Dima).
Dipseudopsis schoutedeni Lestage.—Belgian Congo.
Dipseudopsis simplex Ulmer.—Belgian Congo.

59.57,34 (67.5)

Article IV.—AFRICAN STONE-FLIES AND MAY-FLIES COLLECTED BY THE AMERICAN MUSEUM CONGO EXPEDITION[1]

By James G. Needham

Plate V

The few specimens of the above-named groups collected by the Congo Expedition have proved of very great interest and are described herewith.

PLECOPTERA

Two, or possibly three, species of stone-flies of the genus *Neoperla* were taken by Messrs. Lang and Chapin at Faradje, Belgian Congo, 29° 40′ E., 3° 40′ N. The African species of this genus are inadequately described. The first to be made known was Newman's *N. spio* from Sierra Leone (Newman, 1839, p. 86). Six others are briefly characterized in an analytical key by Klapalek (1909 *b*, p. 218), four of them as new species, without any description other than diagnostic characters (some of which are mere color characters), without measurement, and without more specific designation of localities. Two species of the Congo Expedition collection are represented by both sexes and, in both, are so strongly marked that it seems possible to identify them with two that are named in Klapalek's key. These two are more fully characterized herewith. The third, somewhat larger, form (possible species) is represented by a single female in bad condition, and is specifically unidentifiable.

Neoperla Needham

Pseudoperla Banks, 1892, Trans. Amer. Ent. Soc , XIX, p. 332 (preoccupied).

Neoperla Needham, 1905, Proc. Ent. Soc. Washington, p. 108. Klapalek, 1909, Wien. Entom. Zeitg., XXVIII, p. 216.

Ochthopetina Enderlein, 1909, Entom. Zeitg. Stettin, LXX, p. 324.

This genus includes all the African Plecoptera and is also found in America, India, Indomalaya, and Japan. It is the dominant genus of stone-flies in the tropics of the world.

Since so little is known of the African Plecoptera the following list of species described from the Ethiopian region may prove useful. The years and pages refer to the appended bibliography.

---

[1] Scientific Results of the Congo Expedition. Entomology, No. 5.

Neoperla africana Klapalek, 1909 *a*, p. 56.—Cameroon (Johann Albrechtshöhe, Kribi); German East Africa (Ukami, Langenburg).

Neoperla camerunensis (Enderlein), 1909 *a*, p. 343.—Cameroon (Barombi); Belgian Congo (Kitobola).

Neoperla conradti (Enderlein), 1909 *a*, p. 335.—Cameroon (Barombi).

Neoperla didita (Enderlein), 1909 *a*, p. 345.—Cameroon (Barombi).

Neoperla dubia Klapalek, 1909 *b*, p. 218.—Africa; Belgian Congo (Faradje).

Neoperla excisa Klapalek, 1909 *b*, p. 218.—Africa; Belgian Congo (Faradje).

Neoperla laticollis Klapalek, 1909 *b*, p. 218.—Africa.

Neoperla leroiana Klapalek, 1911, p. 103.—Anglo-Egyptian Sudan (Redjaf).

Neoperla nigricauda Klapalek, 1909 *a*, p. 218. —Africa.

Neoperla sjöstedti Klapalek, 1909 *a*, p. 55.—Mt. Kilimanjaro (Kibonoto, 1300–1900 m.); Mt. Ruwenzori (western slope, at 2000 m.).

Neoperla spio (Newman), 1839, p. 86.—Sierra Leone.

Neoperla tenera (Navás), 1915, p. 4.—Abyssinia (Endessa, Haut Aouache).

Neoperla transvaalensis (Enderlein), 1909 *b*, p. 402.—Transvaal (Zoutpansberg).

Neoperla excisa Klapalek

Plate V, Figures 13, 15 and 17

Length to wing tips 12 mm. Expanse 21 mm. in male. Color uniformly dull yellowish over body, wings, and appendages, the tips of the last hardly darker in color, the veins of the fore wings brownish. Ocelli large, close-set, these being separated by a space that is less than half the diameter of one of them.

The distinctive characters of this species lie almost wholly in the secondary sexual characters. In the male, segment ten of the abdomen is divided on the mid-dorsal line, and the two anteriorly directed dorsal horns are slender, nearly smooth, approximated in their basal half and divergent toward the tips. Between the bases of these horns, the free, flaplike, inner ends of the divided dorsum are thickly studded with minute, roundish, brown, button-like, chitinous nodules, covering the convex upper surface, one hundred or more on each flap. On the dorsum of the eighth segment a conic-triangular, brown, heavily chitinized process arises under the tips of the paired horns, and like them is directed forward. The tip of this median process is directed toward a shallow notch in the emarginate chitinized apical ring of abdominal segment seven, and beside the emargination and beneath the tip of the process are a few larger and darker chitinous nodules.

The female is similar to the male in coloration, slightly larger in size, and bears no well-marked external sex characteristics, the apical margin of the eighth abdominal segment on the ventral side is slightly emarginate toward the median line and more strongly chitinized over a minute and very shallow median concavity in this margin. The shell of the ovarian egg is marked by about eight to twelve straight, low longitudinal ridges that divide the surface into areas like the staves on a barrel, that extend over four-fifths the length of the egg, but that do not reach either the shell aperture at the micropyle or the more pointed opposite end.

One male and one female. Faradje, Belgian Congo.

Neoperla dubia Klapalek

Plate V, Figures 12, 14 and 16

Length to tip of wings 13 mm. Expanse 23 mm. in male. Color brownish, becoming yellowish below and on bases of all appendages. Legs yellowish, suffused with brown on knees externally and on tarsi beyond the basal segment. Both fore and hind wings smoky yellowish brown with dark brown veins.

Like the preceding species the critical diagnostic characters are found in the genitalia. The horns on the dorsally cleft tenth abdominal segment are slender and parallel beyond their converging bases. Like the horns, the internal flaps between their bases are bare. The dorsum of the ninth segment is somewhat saddle-shaped, with a raised, broadly rounded area each side, that is studded with some forty to fifty setigerous punctures, bearing long divaricate bristles. At the rear of the seventh segment rises a long flattened conical process that is directed backward. Its tridentate tip lies between the tips of the paired horns.

In the female the apical margin of the eighth abdominal segment is slightly produced in the mid-ventral line, in a minute, roundish, scale-like flap covering the genital aperture, and the tip of this scale-like portion shows a more or less evident median apical emargination.

The lower portion of the oviduct is densely clothed within by minute conic prickles, whose points are directed outward. This chitin-lined portion is coiled several turns, and has a length equal to that of several abdominal segments.

The shell of the egg of this species shows some thirty to forty very oblique longitudinal striæ, spirally wound about it, and reaching to its obtuse ends.

Several specimens of both sexes from Faradje, Belgian Congo.

Plecoptera Recorded from the Belgian Congo

Perlidæ

Neoperla Needham

Neoperla camerunensis (Enderlein).—Lower Congo (Kitobola).
Neoperla dubia Klapalek. See above.
Neoperla excisa Klapalek. See above.
Neoperla sjöstedti Klapalek.—Western slope of Mt. Ruwenzori, at 2000 m.

Klapalek has also described three nymphs of Perlidæ taken in the Belgian Congo (forest 90 kilom. west of the southern shore of Lake Albert Edward) and Lestage has described and figured three additional species of nymphs from the Maba River, near Mlonda (western shore of Tanganyika). All these are undetermined species of *Neoperla*.

BIBLIOGRAPHY OF AFRICAN PLECOPTERA

Enderlein, G. 1909 *a*. Plecopterologische Studien, II. Entom. Zeitg. Stettin, LXX, pp. 324–352.

1909 *b*. Klassifikation der Plecopteren, sowie Diagnosen neuer Gattungen und Arten. Zoolog. Anz., XXIV, pp. 385–419.

KLAPALEK, F. 1909 *a*. Plecoptera. Zoolog. Ergebn. Sjöstedt Kilimandjaro Exp., II, 14, 3, pp. 55–58.

1909 *b*. Vorläufiger Bericht über exotische Plecopteren. Wien. Entom. Zeitg., XXVIII, pp. 215–232.

1911. *Neoperla leroiana* n. sp. Wien. Entom. Zeitg., XXX, pp. 103–104.

1912. Plecoptera. Wiss. Ergebn. Deutsch. Zentr. Afr. Exp. (1907–08), III, pp. 447–452.

LESTAGE, J. A. 1917. Deuxième contribution à l'étude des larves des Éphémères et Perlides du Congo Belge. Rev. Zoolog. Afric., V, pp. 134–140.

NAVÁS, L. 1912. Sur quelques Névroptères d'Afrique. Rev. Zoolog. Afric., I, pp. 401–410.

1915. Neurópteros nuevos o poco conocidos, IV. Mem. Ac. Cienc. Barcelona, (3) XI, No. 23, pp. 1–28.

NEWMAN, E. 1839. On the synonymy of the *Perlites*, together with brief characters of the old, and of a few new species. Mag. Nat. Hist., N. S., III, pp. 84–90.

EPHEMERIDA

A single male adult May-fly appeared among the pinned specimens brought from the Belgian Congo by Messrs. Lang and Chapin. However, when a dilapidated and crumpled specimen of the stone-fly *Neoperla excisa* was boiled for study, two additional minute specimens of another May-fly were loosened from some place of concealment underneath the stone-fly, and floated freely away from it in the water. These, thus softened, were fit for study, and upon examination proved to be apparently a nymph and a male imago of the same species. They represent a new genus, as well—one closely allied to the cosmopolitan genus *Cænis*. This is one of the smallest of May-flies. The other pinned specimen is one of the largest of May-flies. It is the fine species for which Navás proposed the generic name *Eatonica*. Its generic position has been discussed by Eaton, Navás, Ulmer, and Lestage without much agreement. Lestage has summarized the evidence in the Revue Zoologique Africaine, VI, 1918, pp. 82 to 89, and we follow him in calling this species *Pentagenia schoutedeni*. The nymphs of all the genera in question are much more strongly characterized than are the adults; but the nymph of this species is as yet unknown. Both this species and the new one are herewith described and illustrated.

Pentagenia schoutedeni (Navás)

Plate V, Figures 1 and 2

Length about 17 mm., tails 40 mm. additional. Expanse of wings 30 mm.

Color brownish, darker on dorsum and on all carinæ, paler beneath. Fore and middle legs are lacking from the single specimen; the single hind leg present is pale and concolorous, as are the setæ. The middle tail, in the male, aborted to a few-segmented rudiment. Claws very dissimilar, one of each tarsus being broadly flabellate; the other, sharply uncinate. Venation as shown in Plate V, figure 1. Wings opalescent and irridescent; fore wings strongly marked with a broad costal band of brown. All veins tinged with a deeper shade of purplish brown, the transverse veins about the base of both wings and a few others near the middle of the hind wings more broadly margined with the same color.

Forceps of the male strong, the elongate middle segment curved almost in a semicircle, the single small terminal joint twice as long as wide. Penes separated at tip in less than half their length, in a V-shaped notch; each bearing a low subterminal obtuse hook just below the aperture of the recurved sperm duct.

One male. Faradje, Belgian Congo. Lestage reports this species as being distributed throughout equatorial Africa.

CÆNOPSIS, new genus

Allied to *Cœnis*. Tails three, middle one longest. Forceps of the male at least three-jointed, the third joint very long and flexible. Claws dissimilar, one sharply hooked, one blunt. Terminal tarsal segment as long as the three basal segments. Wings two. Venation as shown in Plate V, figure 3, differing from *Cœnis* in better preservation of typical forks and in a wider band of cross-veins.

Cænopsis fugitans, new species

Plate V, Figures 3 to 11

Length 4 mm., tails 9 mm. (middle one 10 mm.) additional. Expanse of wings 10 mm.

Color blackish, with pale setæ and whitish wings. Head blackish, paler in rear, antennæ pale. Thorax and abdomen black, the latter with sooty black patches on sides of segments one to eight and on mid-dorsum of segments nine and ten. Tibiæ each with a minute sooty patch just below the knee joint. Wings with smoky costal band that is darkest along the subcostal vein. Male forceps wholly pale, basal segment not longer than wide; middle segment five times as long, cylindric, end segment longer than all the basal parts collectively, tapering and flexible in its terminal portion. Penes fused into a single pyriform organ except at tip where a median cleft remains, and surrounded beneath by a V-shaped ring of chitin at the apex of the tenth abdominal segment, the arms of the V reaching laterally to the base of the forceps each side. Fore tibia of the male three to four times as long as the other tibiæ.

One specimen found as detailed above, with its nymph. Faradje, Belgian Congo.

Nymph.—Length about 7 mm., antennæ 2 mm., setæ broken, perhaps a little longer than the antennæ, width 2 mm. Color apparently greenish black. Body depressed, rather smooth with short legs and thin lateral edges to abdomen.

Head small and rather compact, with small rounded eyes capping its lateral angles. Mouth-parts as shown in Plate V, figures 8 to 11. Prothorax wider than the head with thin flaring anterolateral angles.

Abdomen with a conspicuous mid-dorsal hook on the second abdominal segment and with thin flat lateral spines on segments four to nine, the series on each side curving outward like a segment of a circular saw. Gills on segments one and three to seven, those of segment one simple tapering filaments set erect upon a pedunculate base, those on segment three elytroid and covering the others to rear, those of segments four to seven, thin, flat translucent, whitish plates, obliquely oval in form, the margins fringed with long, forking, respiratory filaments.

One nymph, taken with the adult from the body of the stone-fly *Neoperla excisa,* as noted above.

A complete summary of what has hitherto been published concerning African May-flies will be found in a paper by J A. Lestage entitled: "Les Éphémères d'Afrique: Notes critiques sur les espèces connues" in Revue Zoologique Africaine, VI, 1918, pp. 65–114.

PLATE V

Congo May-flies and Stone-flies.

Fig. 1. Wings of *Pentagenia schoutedeni* (Navás), male.

Fig. 2. Forceps and penes of the same.

Fig. 3. Wing of *Cœnopsis fugitans*, new species, male.

Fig. 4. Forceps and penes of the same.

Fig. 5. Nymph of *Cœnopsis fugitans.*

Fig. 6. Hind foot of same.

Fig. 7. Gill of first abdominal segment of same.

Fig. 8. Mandible of same.

Fig. 9. Maxilla of same.

Fig. 10. Hypopharynx of same.

Fig 11. Labium of same.

Fig. 12. *Neoperla dubia* Klapalek, mid-dorsal aspect of rear segments of the abdomen in the male.

Fig. 13. *Neoperla excisa* Klapalek, showing corresponding parts.

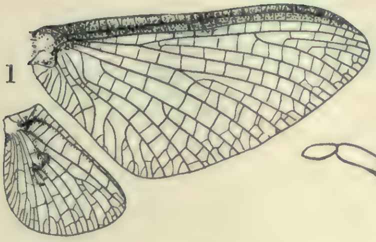
Fig. 14. Egg-shell of *Neoperla dubia,* showing spiral striations.

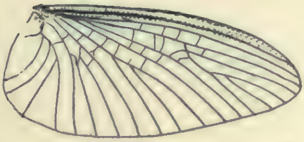
Fig. 15. Egg-shell of *Neoperla excisa,* showing longitudinal ridges.

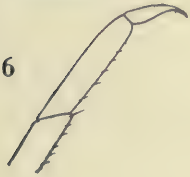
Fig. 16. *Neoperla dubia,* aspect of the eighth ventral segment of the female, showing lamina.

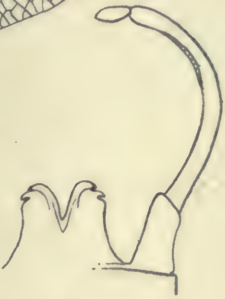
Fig 17. *Neoperla excisa*, showing the retuse corresponding border.

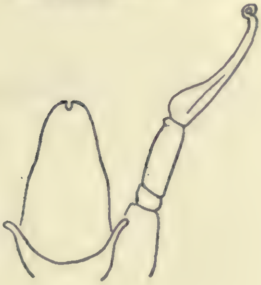
40'

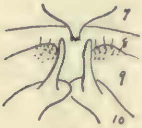

1


3

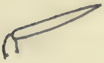

6

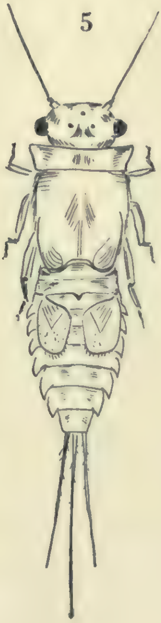

2

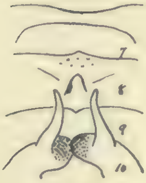

4



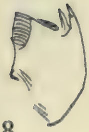
12

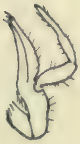

7

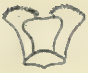

5

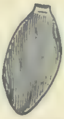


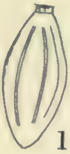
13

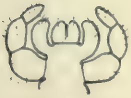

8


9


10


14


15


11

16

17

Psychomyidæ

ECNOMUS MacLachlan

Ecnomus tropicus Ulmer.—Lower Congo (Kinshasa).
Ecnomus deceptor MacLachlan.—Lake Kivu.

Hydropsychidæ

HYDROPSYCHODES Ulmer

Hydropsychodes diminuta (Walker).—Lower Congo (Kinshasa)
Hydropsychodes albomaculata Ulmer.—Lower Congo (Kinshasa).
Hydropsychodes sexfasciata Ulmer. See above.

ÆTHALOPTERA Brauer

Æthaloptera dispar Brauer (= *Primerenca maesi* Navás). See above.

POLYMORPHANISCUS Walker

Polymorphaniscus bipunctatus (Brauer.) See above.

PHANOSTOMA Brauer

Phanostoma senegalense Brauer.—Lower Congo (Kinshasa), Bangala (Lisala).

PROTOMACRONEMA Ulmer

Protomacronema hyalinum Ulmer. See above.

Protomacronema pubescens Ulmer.—Lower Congo (Kinshasa), island of the Congo River at the confluence of the Ubangi.

MACRONEMA Pictet

Macronema capense Walker var. *signatum* Walker.—Ubangi.

Leptoceridæ

LEPTOCERUS Leach

Leptocerus trivittatus Ulmer.—Lower Congo (Kinshasa).

PSEUDOLEPTOCERUS Ulmer

Pseudoleptocerus squamosus (Ulmer).—Lower Congo (Kinshasa).

ŒCETIS MacLachlan

Œcetis fasciata Lestage.—Belgian Congo.

SETODELLINA Lestage

Setodellina albopunctata Lestage.—Belgian Congo.

59.53, 72 (67.5)

Article V.—ISOPODS COLLECTED BY THE AMERICAN MUSEUM CONGO EXPEDITION[1]

By Willard G. Van Name

INTRODUCTION

Twenty-one species, representing three of the primary subdivisions or superfamilies of the Isopoda, were collected by the Congo Expedition. Twelve of these species appear to be new to science. Of the total number, nine are marine or are confined to the immediate vicinity of the sea, one is a true fresh-water form, and the rest are terrestrial. Seven of the aquatic species collected are parasitic on fishes or on other Crustacea. This large proportion is, however, easily explained by the fact that the isopods were largely obtained incidentally to the collection of other animals and that the parasitic forms were thus more likely to be found than free-living ones equally or even more abundant.

While the collection is interesting on account of the comparatively little that is recorded concerning the Isopoda of the Congo region and on account of the new forms contained in it, it is by no means a representative one and the species it comprises cannot be more than a small percentage of those actually found there. Leaving out of account marine forms, which are generally of more or less wide distribution, many land isopods are known from other parts of tropical Africa, not too far distant from the Congo region to make it probable that they may eventually be found to range within its limits, especially as the comparative uniformity of wide stretches of country and the absence of mountain barriers in Africa is favorable to a wide distribution of such animals. No systematic collecting of Isopoda was done; nearly all the specimens were obtained and preserved by Mr. Herbert Lang himself, in intervals when his time and efforts were not occupied in obtaining or caring for more important material; but the fact that even under such conditions a larger collection was not brought back would seem to indicate that the Isopoda do not constitute a very large or conspicuous part of the fauna.

From an economic point of view, the importance of the isopods in the Congo region, as in most other parts of the world, is insignificant. The terrestrial forms are apparently not harmful either from their abundance or habits. The wood-boring aquatic species (*Sphæroma*) was found only in mangrove roots and was not reported as attacking the piling of wharves or bridges, as these animals do to a serious extent in some places. Those parasitic on market fishes are undoubtedly harmful to human interests; though they probably seldom kill the fish, except perhaps very young or weak individuals, they must be very troublesome to them, reducing them in flesh and food value. These parasites fortunately do not appear to be very abundant, as those collected were found only by examining a large number of fishes. If they were numerous, it would seem difficult to devise any way of combating such pests. As food for larger animals, birds, and fishes, the isopods doubtless play some part, but most of them would appear to contain little nourishment and many of the terrestrial species are probably quite unpalatable.

---

[1] Scientific Results of The American Museum Congo Expedition. General Invertebrate Zoology, No. 4.

LITERATURE

Though the literature concerning the isopods of South Africa, East Africa, and some of the extreme western parts of the continent is rather extensive, the published records and notices referring to these animals in the Congo region are comparatively few. The more important of them are, for the most part, contained in or cited in the general monographs of Schiœdte and Meinert (1879–1884) and Hansen (1890); in the works of Stebbing (1908, 1910) on South African Crustacea, as far as the marine forms are concerned; and, for the land isopods, especially in the monographs and reports of the late Prof. G. Budde-Lund (see the bibliography at the end of this article). According to his published statements, Budde-Lund had prepared descriptions and drawings of many other previously unknown African species of land isopods, but the publication of these was prevented by his untimely death. A number of land isopods have been described from Togo Land by Hilgendorf (1893), from Assinie by Dollfus (1892), and from Liberia and Sierra Leone by Richardson (1908), but these have not, as far as I am aware, been found in the Congo region. The following are the species of isopods that I have found reported from this region, taking as limits the west coast of Africa from the latitude of Cape Verde to that of Cape Frio for the marine forms, and for the terrestrial forms the Congo basin and the colonies on the west coast from Cameroon to Portuguese West Africa inclusive.

Marine Isopoda

Æga deshayesiana (Milne-Edwards), 1840.

Æga deshayesiana Schiœdte and Meinert, 1879, Naturhist. Tidsskr., (3) XII, p. 360, Pl. VIII, figs. 7–9.

Rocinela deshayesiana Studer, 1884, Abh. k. Akad. Wiss. Berlin, 1883, phys.-chem. Abt., Suppl., p. 22.

Azores and Cape Verde Islands; also Mediterranean.

Æga webbii (Guérin), 1836.

Æga webbii Schiœdte and Meinert, 1879, Naturhist. Tidsskr., (3) XII, p. 347, Pl. X, figs. 1–4.

Cape of Good Hope to Portugal.

Cirolana cranchii Leach, 1818.

Cirolana swainsonii Miers, 1881, Ann. Mag. Nat. Hist., (5) VIII, p. 370.

Cirolana cranchii Hansen, 1890, Danske Vidensk. Selsk. Skr., (6) V, p. 343, Pl. III, figs. 3–31.

Senegal (Gorée Island); a widely distributed species.

Nerocila rhabdota Kœlbel, 1879.[1]

Nerocila rhabdota Kœlbel, 1879, Sitzungsber. Akad. Wiss. Wien, (math.-nat. Kl.), LXXVIII (Abt. 1), p. 409, Pl. II, figs. 2*a*–2*c*.

Nerocila rhabdota Schiœdte and Meinert, 1881, Naturhist. Tidsskr., (3) XIII, p. 39, Pl. II, figs. 5, 6.

Senegal.

Nerocila cephalotes Schiœdte and Meinert, 1881.[1]

Nerocila cephalotes Schiœdte and Meinert, 1881, Naturhist. Tidsskr., (3) XIII, pp. 8, 9, 60, Pl. IV, figs. 16–18.

Senegal (Gorée Island); Gaboon; Cape of Good Hope.

Anilocra capensis Milne-Edwards, 1840.

Anilocra capensis Schiœdte and Meinert, 1881, Naturhist. Tidsskr., (3) XIII, p. 146, Pl. X, figs. 4, 5.

Teneriffe to Java.

Glossobius linearis (Dana), 1853.

Glossobius linearis Schiœdte and Meinert, 1883, Naturhist. Tidsskr., (3) XIII, p. 301, Pl. XII, figs. 1–9.

Widely distributed parasite of flying fishes; Cape Verde.

Glossobius laticauda (Milne-Edwards), 1840.

Glossobius laticauda Schiœdte and Meinert, 1883, Naturhist. Tidsskr., (3) XIII, p. 309, Pl. VII, figs. 10–16.

Widely distributed parasite of flying fishes; Cape Frio.

Cymothoa plebeia Schiœdte and Meinert, 1884.[1]

Cymothoa plebeia Schiœdte and Meinert, 1884, Naturhist. Tidsskr., (3) XIV, p. 236, Pl. IX, figs. 1, 2.

Cape Verde.

---

[1] Collected also by the American Museum Congo Expedition.

Terrestrial Isopoda

Ligyda gracilipes (Budde-Lund), 1885.

Ligia gracilipes Budde-Lund, 1885, Crust. Isop. Terrestr., p. 270.

Ligia gracilipes Dollfus, 1878, Bull. Soc. Zool. France, XXIII, p. 126.

Portuguese Congo (Landana), Senegal.

Eubelum stipulatum Budde-Lund, 1899.[1]

Eubelum stipulatum Budde-Lund, 1899, Rev. Crust. Isop. Terrestr., Part I, p. 71, Pl. I, figs. 1–16.

West Africa; Cameroon (Bonge).

Eubelum lubricum Budde-Lund, 1885.

Eubelum lubricum Budde-Lund, 1885, Crust. Isop. Terrestr., p. 292.

Eubelum lubricum Budde-Lund, 1899, Rev. Crust. Isop. Terrestr., Part I, p. 72, Pl. II, figs. 1–1.

Portuguese Congo (Landana, Chinchoxo).

Eubelum (Mesarmadillo) albicorne Budde-Lund, 1899.

[*E.*] *Mesarmadillo albicornis* Budde-Lund, 1899, Rev. Crust. Isop. Terrestr., Part I, p. 79, Pl. III, figs. 1–9.

Cameroon (N'dian).

Eubelum (Mesarmadillo) quadrimaculatum, Budde-LunP, 1899.

[*E.*] *Mesarmadillo quadrimaculatus* Budde-Lund, 1899, Rev. Crust. Isop. Terrestr., Part I, p. 80, Pl. III, figs. 13–17.

Cameroon.

Eubelum (Periscyphops) silvanum Budde-Lund, 1899.

[*E.*] *Periscyphops silvanus* Budde-Lund, 1899, Rev. Crust. Isop. Terrestr., Part I, p. 82, Pl. III, figs. 25–27.

Cameroon (Kitta, N'dian, Bibundi, Bonge).

Eubelum (Periscyphops) bizonatum Budde-Lund, 1899.

[*E.*] *Periscyphops bizonatus* Budde-Lund, 1899, Rev. Crust. Isop. Terrestr., Part I, p. 84, Pl. III, figs. 18–24.

Cameroon (Kitta, Bibundi, Bonge).

Eubelum (Periscyphops) gibbosum Budde-Lund, 1899.

[*E.*] *Periscyphops gibbosus* Budde-Lund, 1899, Rev. Crust. Isop. Terrestr., Part I, p. 85, Pl. V, figs. 23–25.

Cameroon (Bibundi).

Eubelum (Periscyphops) squamatum Budde-Lund, 1899.

[*E.*] *Periscyphops squamatus* Budde-Lund, 1899, Rev. Crust. Isop. Terrestr., Part I, p. 86, Pl. V, figs. 1–6.

Cameroon (Bibundi).

Eubelum (Periscyphops) squamosum Budde-Lund, 1899.

[*E.*] *Periscyphops squamosus* Budde-Lund, 1899, Rev. Crust. Isop. Terrestr., Part I, p. 87, Pl. V, figs. 7–10.

Cameroon (Bibundi).

Synarmadillo albinotatus Budde-Lund, 1908.

Synarmadillo albinotatus, Budde-Lund, 1908, in Voeltzkow, Reise in Ostafrika, II, p. 277, Pl. XIII, fig. 47.

---

[1] Collected also by the American Museum Congo Expedition.

Synarmadillo cristifrons (Hilgendorf), 1893.

Periscyphis cristifrons Hilgendorf, 1893, Sitzungsber. Gesell. nat. Freunde, Berlin, p. 152.

Synarmadillo cristifrons Budde-Lund, 1908, in Voeltzkow, Reise in Ostafrika, p. 277, Pl. XIII, fig. 48.

Cameroon (Kribi, Buea, Barombi Station).

Synarmadillo globus Budde-Lund, 1908.[1]

Synarmadillo globus Budde-Lund, 1908, in Voeltzkow, Reise in Ostafrika, III, p. 276, Pl. XIII, figs. 37–44.

Cameroon (Bibundi, Bonge).

Cubaris (*Diploexochus*) *aculeata* (Budde-Lund), 1885.

Armadillo aculeatus Budde-Lund, 1885, Crust. Isop. Terrestr., p. 289.

Diploexochus aculeatus Stebbing, 1910, Ann. South African Mus., VI, p. 446.

Portuguese Congo (Landana, Chinchoxo).

Niambia squamata (Budde-Lund), 1885.[1]

Porcellio (*Leptotrichus*) *squamatus*, Budde-Lund, 1885, Crust. Isop. Terrestr., p. 196.

Niambia squamata Budde-Lund, 1909, in Schultze, Reise in Südafrika, p. 60, Pl. VI, figs. 1–3.

Portuguese Congo (Landana, Chinchoxo).

Rhyscotus globiceps Budde-Lund, 1908.

Rhyscotus globiceps, Budde-Lund, 1908, in Voelzkow, Reise in Ostafrika, II, p. 301, Pl. XVII, figs. 41–45.

French Congo (Loango).

Philoscia (*Anchiphiloscia*) *cunningtoni* Stebbing, 1908.

Anchiphiloscia cunningtoni Stebbing, 1908, Proc. Zool. Soc. London, p. 557, Pl. XXVII, B.

North East Rhodesia (Niamkolo Bay, southern shore of Lake Tanganyika).

The following additional species are from localities but little beyond the above limits.

Eubelum pila Budde-Lund, 1898.

Eubelum pila Budde-Lund, 1898, Deutsch Ost-Afr., IV, Land-Isopoden, p. 4.

Mt. Ruwenzori, on the western slope at 2600 m.

Eubelum hilgendorfii Budde-Lund, 1898.

Eubelum hilgendorfii Budde-Lund, 1898, Deutsch Ost-Afr., IV, Land-Isopoden, p. 4, figs. 1, 2.

Mt. Ruwenzori, on the western slope at 2600–3100 m.

Periscyphis nanus Budde-Lund, 1898.

Periscyphis nanus Budde-Lund, 1898, Deutsch Ost-Afr., IV, Land-Isopoden, p. 5, fig. 6.

Mt. Ruwenzori, on the western slope at 3100 m.

Periscyphis pygmæus Budde-Lund, 1898.

Periscyphis pygmæus Budde-Lund, 1898, Deutsch Ost-Afr., IV, Land-Isopoden, p. 6, figs. 10, 11.

Mt. Ruwenzori, on the western slope at 3100 m.

---

[1] Collected also by the American Museum Congo Expedition.

Synarmadilloides roccatii Nobili, 1906.

Synarmadilloides roccatii Nobili, 1906, Boll. Mus. Zool. Anat. Torino, XXI, No. 544, p. 2.

Eastern slope of Mt. Ruwenzori at 3000 m., Toro.

Porcellio (*Porcellionides*) *pruinosus* (Brandt), 1833.

Metoponorthus pruinosus Budde-Lund, 1898, Deutsch Ost-Afr., IV, Land-Isopoden, p. 8.

Region of Mt. Ruwenzori. (This species is of almost world-wide distribution.)

Philoscia maculicornis Budde-Lund, 1898.

Philoscia maculicornis Budde-Lund, 1898, Deutsch Ost-Afr., IV, Land-Isopoden, p. 9.

On the shore of Lake Albert, November 26, 1891. According to Stuhlmann's diary this locality is on the southwestern shore of the lake, in Belgian territory.

Philoscia mendica Budde-Lund, 1898.

Philoscia mendica Budde-Lund, 1898, Deutsch Ost-Afr., IV, Land-Isopoden, p. 9, figs. 14, 15.

Region of Mt. Ruwenzori.

THE CONGO EXPEDITION COLLECTION

The following are the species comprised in the collection and described and figured in the present article.

Superfamily FLABELLOIDEA

PAGE
1. *Eurydice carangis*, new species........ 49
2. *Nerocila cephalotes* Schiœdte and Meinert, 1881........ 53
3. *Nerocila rhabdota* Kœlbel, 1879........ 57
4. *Cymothoa plebeia* Schiœdte and Meinert, 1884........ 59
5. *Ichthyoxenos expansus*, new species........ 60
6. *Sphæroma destructor* Richardson, 1897........ 63

Superfamily BOPYROIDEA

7. *Pleurocrypta langi*, new species........ 67
8. *Pseudione chapini*, new species........ 69

Superfamily ONISCOIDEA

9. *Ligyda exotica* (Roux), 1828........ 72
10. *Ligyda olfersii* (Brandt), 1833........ 77
11. *Eubelum stanleyanum*, new species........ 78
12. *Eubelum stipulatum* Budde-Lund, 1899........ 81
13. *Eubelum propinquum*, new species........ 84
14. *Eubelum asperius*, new species........ 86
15. *Eubelum garambæ*, new species........ 89
16. *Eubelum tenebrarum*, new species........ 91
17. *Synarmadillo globus* Budde-Lund, 1908........ 92
18. *Synarmadillo lubilensis*, new species........ 95
19. *Cubaris* (*Diploexochus*) *bananæ*, new species........ 97
20. *Cubaris* (*Diploexochus*) *regulus*, new species........ 100
21. *Niambia squamata* (Budde-Lund), 1885........ 102

Approximate Location of Places where Specimens were Collected

Avakubi.—1° 20′ N., 27° 40′ E.
Banana.—6° S., 12° 20′ E.
Bengamisa.—1° N., 25° 10′ E.
Garamba.—4° 10′ N., 29° 40′ E.
Lubila R.—1° N., 26° 30′ E.
Malela.—6° S., 12° 40′ E.
Medje.—2° 25′ N., 27° 30′ E.
Poko.—3° 10′ N., 26° 50′ E.
St. Antonio.—6° 10′ S., 12° 20′ E.
Stanleyville.—0° 30′ N., 25° 15′ E.
Thysville.—5° 30′ S., 15° E.
Uele River.—3° 30′ N., 30° to 30° E.
Zambi.—6° S., 12° 50′ E.

The preponderance of parasitic forms among the aquatic species, has been noted and an explanation offered. Naturally the majority of new species are among the terrestrial forms; no less than five of them, besides one previously described, belong to the typical subgenus of *Eubelum*, a large genus particularly characteristic of tropical Africa, its typical subgenus being confined to that region. An interesting and unexpected discovery is that of a species assignable to the genus *Ichthyoxenos*, a group parasitic on fresh-water fishes, hitherto known only from East Indian and Asiatic fresh waters. The fact that there is considerable resemblance between the isopod faunas of Africa and the West Indies and South America has been noted by previous writers (see Budde-Lund, 1893, p. 3), though, considering the ease with which such small creatures may be accidentally transported, it does not seem that too much significance should be ascribed to the similarity. The present collection, however, bears out this relationship in the case of the marine and littoral forms, three of which appear to belong to species found also on the American side, while three others have allies there separable only on very slight characters.

In concluding these preliminary remarks, I wish to express my thanks to the leader of the expedition, Mr. Herbert Lang, for his care in preserving and labeling the specimens and to him and Dr. J. Bequaert for information and corrections, particularly those relating to the geography of the region; also to Mr. Roy W. Miner of the American Museum for his help and encouragement in the work of preparing this article.

DESCRIPTIONS OF SPECIES

When possible, and except when otherwise stated or clearly indicated from the nature of the characters under consideration, the descriptions and illustrations have been prepared from female specimens, even when the similarity of the two sexes made this apparently a matter of indifference. Any differences between the sexes that were observed have been noted or illustrated. The specimens of the new species chiefly used in preparing the descriptions and drawings have been designated and catalogued as types, although in many cases they have been badly damaged by the continued handling and the dissection necessary in making out their characters. To prevent misunderstanding it may be well to state that in the case of previously described species the following descriptions and figures are based on Congo Expedition specimens exclusively, and not partly on the descriptions of other authors.

The small number of groups and species dealt with makes the classification adopted here a matter of minor importance. That a very conservative course in the recognition of families and genera has been followed is not due either to reactionary spirit or to any failure to recognize most of the divisions established by recent authors as natural groups, but to the belief that the splitting of genera and families has been carried to an extent that, by magnifying the importance of small differences, hinders the proper recognition of much more important points of resemblance and relationship, and that it has become the chief source of the instability and inconvenience of our present system of nomenclature. It has also often resulted in the necessity of defining the genera by such minute characters or complex and arbitrary combinations of characters that new species, or even some of the old ones, do not fit into them, and the alternative is presented of indefinitely multiplying the genera or of admitting exceptions and qualifications which break down the distinctness of the groups. It seems as if such considerations should lead us to accept the breaking up of well-established and natural groups with much caution, and to keep in mind that the mere fact that distinct sections within a group can be recognized, or that the group is a large one, are in themselves no reasons for its complete disintegration, with the result of usually compelling changes in the names of nearly all its members.

Superfamily **CYMOTHOIDEA** (=Flabellifera)

Cymothoidæ

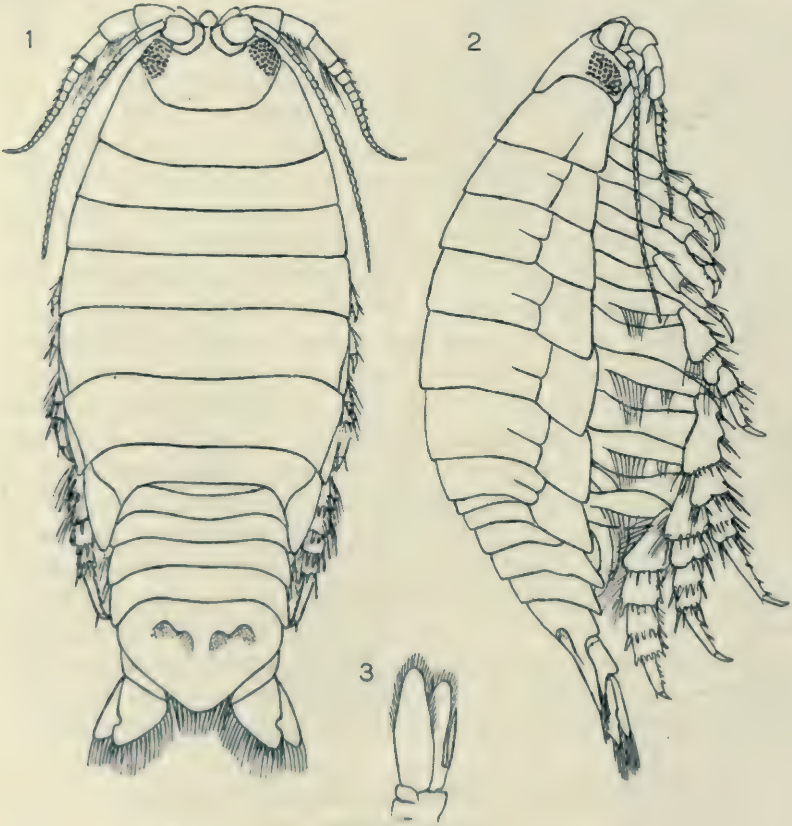
Eurydicinæ (=Cirolanidæ *auct. mult.;* Eurydicidæ, Stebbing, 1905)

Eurydice carangis, new species

Text Figures 1 to 5

Body, as seen from above, of elongate-oval outline, the widest part somewhat anterior to the middle. The abdomen is rather short and considerably narrower than the thorax, but the large epimera of the posterior thoracic segments fill in the general outline so that it is nearly continuous. Back strongly arched; its surface smooth. Length of largest specimens (to tip of abdomen) about 10 mm.; ratio of greatest width to length about 6 to 14.5.

Head narrow, and as seen from above deeply set back into the first thoracic segment; its anterior border produced at the middle into a short and narrow rostrum, each side of which the outline of the head is deeply concave to receive the broad, flattened, basal segments of the first antennæ that occupy nearly all the space between the rostrum and the fore part of the eyes. The latter are large and deeply pigmented, irregularly oblong, with about 50 ocelli. The rostrum joins, at its forward extremity, the somewhat quadrate, enlarged end of the frontal lamina, that extends up from below and forms the most anterior part of the head. First antennæ very long, exceeding the second pair and reaching, when well drawn back, beyond the middle of the fourth thoracic segment. The first two segments of the peduncle are, as already stated, very wide and flattened; the first is so short that, as seen from above, it appears merely as a border to the second. The third segment is narrow,



Figs. 1 to 3. *Eurydice carangis*, new species.
1 and 2. Female, × 10.
3. Second pleopod of male, × 14.

elongate, and cylindrical, and bears at its distal end what appears to be a small vestigial fourth segment, incompletely united with the third. The flagellum is long and slender, having twenty-five to twenty-eight articles, of which the proximal one is usually much longer than any of the others. Second antennæ much stouter than the first, reaching, when well drawn back, to the posterior edge of the third thoracic segment; the peduncle has four segments, the first of which is composed of two short segments fused together; the flagellum is stout and tapering, with fifteen to eighteen articles. The clypeus ends in a free, triangular, downwardly and forwardly extending apex. The extended lobe of the second segment of the maxilliped bears a single hook.

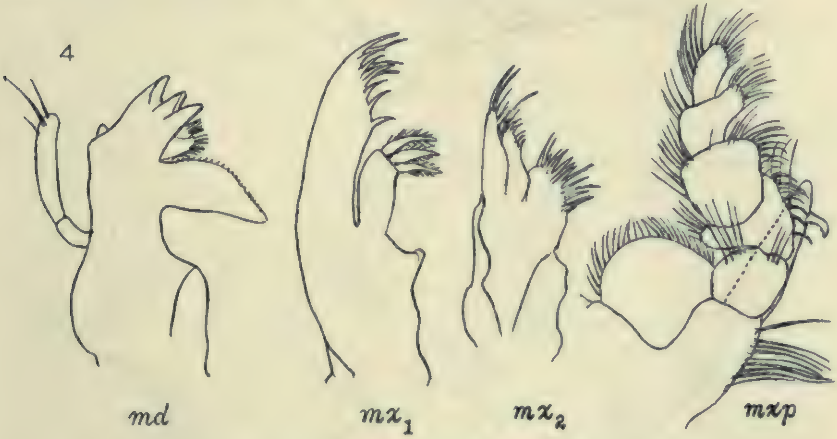


Fig. 4. *Eurydice carangis*, new species. Mouth-parts of female, × 40.

The first, fifth, and sixth thoracic segments are longer than the others; the epimera of all the thoracic segments are distinct and movably jointed to them except in the case of the first. Their external surface is smooth and without any furrow. The epimera end behind in an angle which is very slightly produced backward in the anterior segments but much more so in the posterior ones. The four last pairs of legs are provided with numerous spines and hairs.

The abdomen has six distinct segments; the first more or less covered by the last segment of the thorax, and the others successively longer. Only the fourth and fifth have the lateral angles produced and bent backwards. The terminal segment is triangular, but rounded off at the extreme apex. A conspicuous depression on its dorsal surface each side of the median line marks off a raised anterior border from the comparatively flat posterior part. There is no distinct median carina. The foliaceous parts of the pleopoda are rather elongate; the uropoda are short, with the terminal branches somewhat triangular and obliquely truncated. Their inner branch is wide and has a conspicuous notch on its outer border a little way from the end; the outer branch is both shorter and narrower. There are moderately long hairs on the inner and posterior margins of both branches of the uropoda and on the rounded part of the tip of the abdomen, but none on the outer margins of the branches of the uropoda.

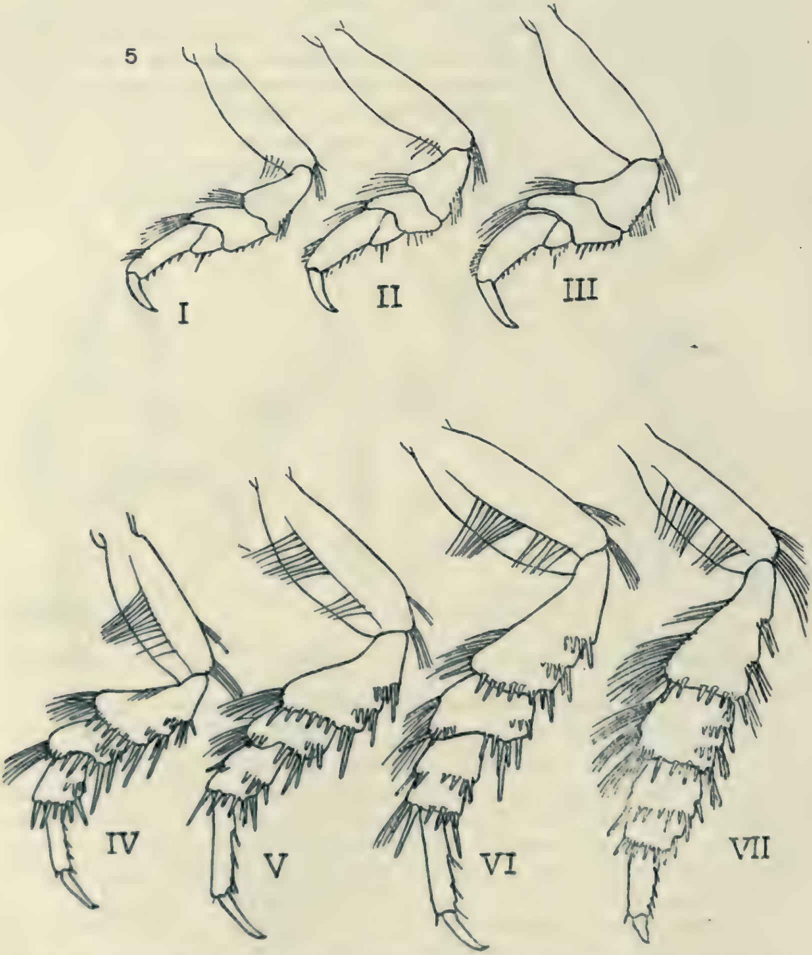


Fig. 5. *Eurydice carangis*, new species. Legs of right side of female, external aspect, × 16.

Color, in alcohol, yellowish with many small irregularly stellate or branching spots of black pigment on the upper parts.

The above description is from female specimens, but the sexual differences are not conspicuous. The males have the peduncular segments of the second antennæ averaging a little stouter than in the females. The process of the second pleopod of the male is straight and shaped like a knife blade, tapering to a point from near the middle of its length; it is shorter than the foliaceous branches of the appendage.

A majority of the numerous examples collected were obtained on fishes, *Caranx hippos* (Linné), brought to market at Banana and St. Antonio. Many of them are young individuals. Males predominate among the adults. The young differ little in general appearance from older examples except in size. The specimens in the collection are as follows:

Cat. No. 3250. St. Antonio, August 1915. 1 specimen. Type.
Cat. No. 3253. St. Antonio, August 1915. About 50 specimens. Cotypes.
Cat. No. 3255. Banana, July 1915. 4 specimens.
Cat. No. 3252. Banana, August 1915. About 40 specimens. "Taken from dead sea stars."

This species, remarkable for the great length of the first antennæ, is one of several that are intermediate in character between *Eurydice* Leach, 1815, and *Cirolana* Leach, 1818; the four-jointed peduncle of the second antennæ would place it in the former genus (the course adopted here), while the absence of a right-angled bend in the basal portion of the second antennæ and the presence of a hook on the extended second lobe of the maxilliped would place it in *Cirolana*. If placed in *Cirolana*, it would be a member of the subgenus *Excirolana* Richardson (1913, Proc. U. S. Nat. Mus., XLIII, p. 201). It is very closely related to *E. natalensis* (Vanhoeffen, 1914, p. 500, fig. 42) from Natal, but that form has shorter first antennæ and lacks the notch on the inner division of the uropoda. Such species as this render the distinction between the genera *Cirolana* and *Eurydice* difficult to maintain.

Cymothoinæ (=Cymothoidæ *auct. mult.*)

Nerocila cephalotes Schiœdte and Meinert

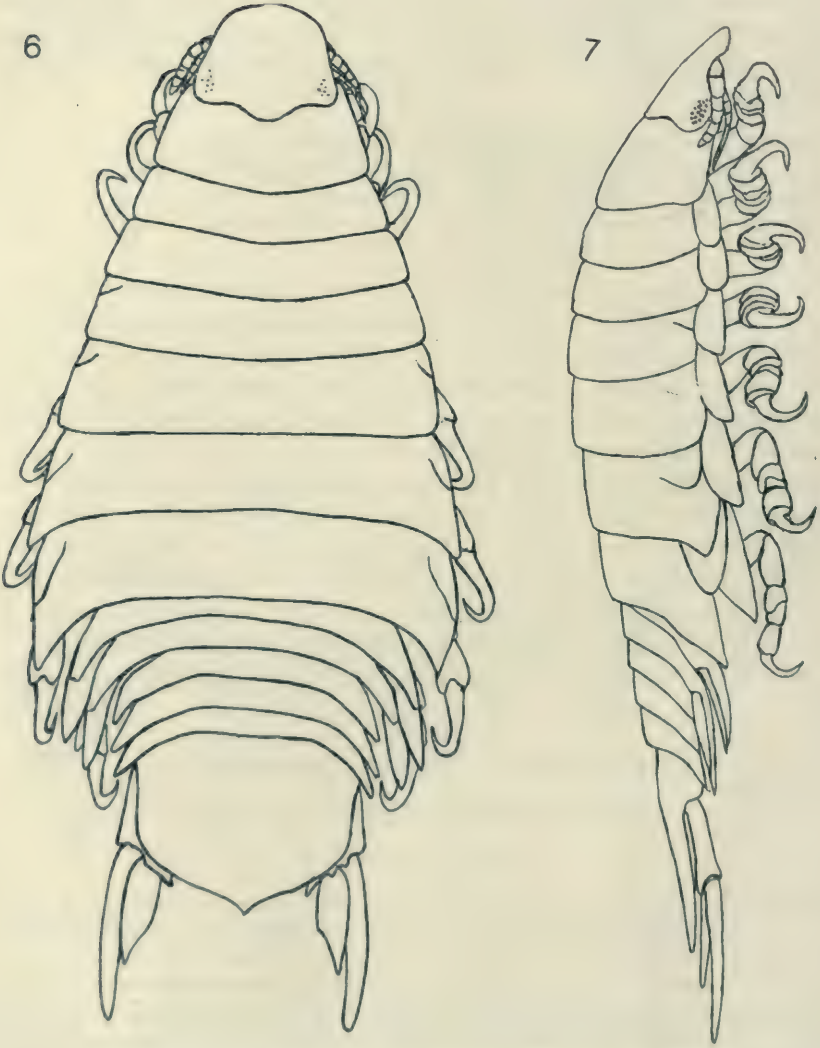
Text Figures 6 to 9

Nerocila cephalotes[1] SCHIŒDTE AND MEINERT, 1881, Naturhist. Tidsskr., (3) XIII, pp. 8, 9, and 60, Pl. IV, figs. 16, 18. STEBBING, 1910, Ann. South African Mus., VI, p. 423. BARNARD, 1914, Ann. South African Mus., X, p. 371.

The largest and apparently the oldest specimen of this species has adult female characters, including a brood pouch; it measures 24.5 mm. long by about 11.4 mm. wide. Body somewhat asymmetrical, widest at the junction of the sixth and seventh thoracic segments; back moderately convex, the surface very hard and smooth. Seven thoracic and six abdominal segments distinct and separate.

---

[1] The original description (*loc. cit.*, p. 60) is headed *N. cepholotes*, but this obvious misprint need be accorded no standing in nomenclature, as in the key and introductory remarks on preceding pages (pp. 8 and 9) where some of the characters of this species are also given, the name is correctly spelled *cephalotes*, as also in all other parts of the work except p. 60.



Figs. 6 and 7. *Nerocila cephalotes* Schiœdte and Meinert, 1881.
6. Female, × 5.
7. Female, side view of slightly younger individual, × 5.

Head small, gently convex in front and three-lobed behind; eyes rudimentary, being reduced to irregular pigmented areas with very imperfect lenses; first antennæ with eight, the second with ten segments, inclusive of the peduncular ones (some other specimens have eleven segments).

The first, fifth, sixth, and seventh thoracic segments are the longest; the second, third, and fourth are short. The posterior lateral angles of the first are very slightly produced backward and rounded off; those of the sixth and seventh are considerably produced and of angular form. The intermediate ones are not produced at all. The above refers to the main part of the segments, not to the epimera. The epimera of all but the first are distinctly separated from the segment; those of the second and third segments are rounded off behind; the following ones are successively more and more pointed. The legs have strong hooked claws; the last pair of legs, though long, are slenderer than the others and have weaker claws.

The abdominal segments, except the last, are short; the first and second have their lateral ends extended backward into long sharply pointed processes. The terminal segment of the abdomen is very broad; it is shield-shaped, and ends in a small, median triangular projection. It is nearly flat with only a slightly thickened anterior margin and a slight suggestion of a median ridge. The outer ramus of the uropoda may be described as broadly saber-shaped; it is slightly curved and about equal to the last segment of the abdomen in actual length, but from its position it extends beyond the end of the abdomen for about half its own length. The inner ramus is less than two-thirds the length of the outer, but is broader. Neither the uropoda nor the last segment of the abdomen are fringed with hairs.

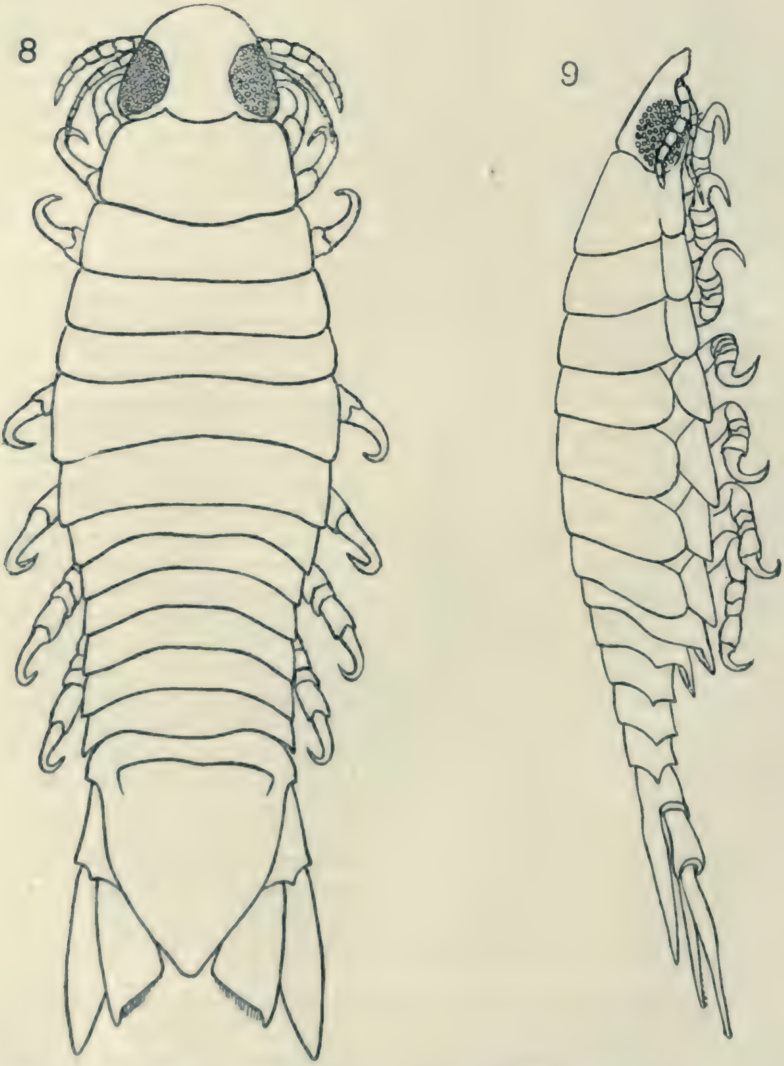
Somewhat younger individuals may equal the specimen just described in length, but are proportionately narrower, usually exhibit little or no lateral asymmetry, and have the eyes less reduced and still provided with well-formed lenses.

Very much younger specimens (Figs. 8 and 9) are quite different and would not, at first sight, be regarded as of the same species. The smallest one in the collection measures about 9 mm. long. The body is symmetrical and much narrower than in the adult, but the head is proportionately larger and broader and provided with a pair of very large, evidently perfectly functional eyes; the angles of the posterior thoracic and anterior abdominal segments, as well as those of the epimera, are little produced; the abdomen is less abruptly narrower than the thorax and its last segment is less broad, tapering more gradually to a sharp point at the end. All these characters give the body as seen from above a smoother outline. The branches of the uropoda are proportionately shorter and broader, and the inner pair (in very young individuals also the end of the last abdominal segment) are fringed with hairs.

In some of these young and slender-bodied individuals male characters can be recognized. The older, wide-bodied individuals, such as the one first described above, are all females.

All the specimens have the under parts and legs yellowish; the upper parts in the best preserved specimens are olive with two broad, yellowish, longitudinal stripes separated by a rather wide, median, olive stripe; but many of them, perhaps because of fading, are better described as mostly yellowish above with three olive stripes.

Schiœdte and Meinert (1881) give the following distribution for this species: Gorée, Senegal; Gaboon; Cape of Good Hope; Cape Agulhas (Cape Colony). Stebbing (1910) also records it from Cape Colony. The



Figs. 8 and 9. *Nerocila cephalotes* Schiødte and Meinert, 1881. Young individuals, × 7.5.

reader is referred to Schiœdte and Meinert's work for a more particular description. They had the advantage of having both older (36.5 mm. long) and younger (4.7 mm. long) specimens for study than those obtained by the Congo Expedition, which are as follows:

Cat. Nos. 3234 and 3239. St. Antonio, August 1915. About 50 specimens.
Cat. No. 3248. Banana. July–August 1915. 5 specimens.

All were found on marine fishes (chiefly *Caranx*) brought to market. They were adhering to various parts of the body or fins of the fish, sometimes more than one of the isopods on one fish.

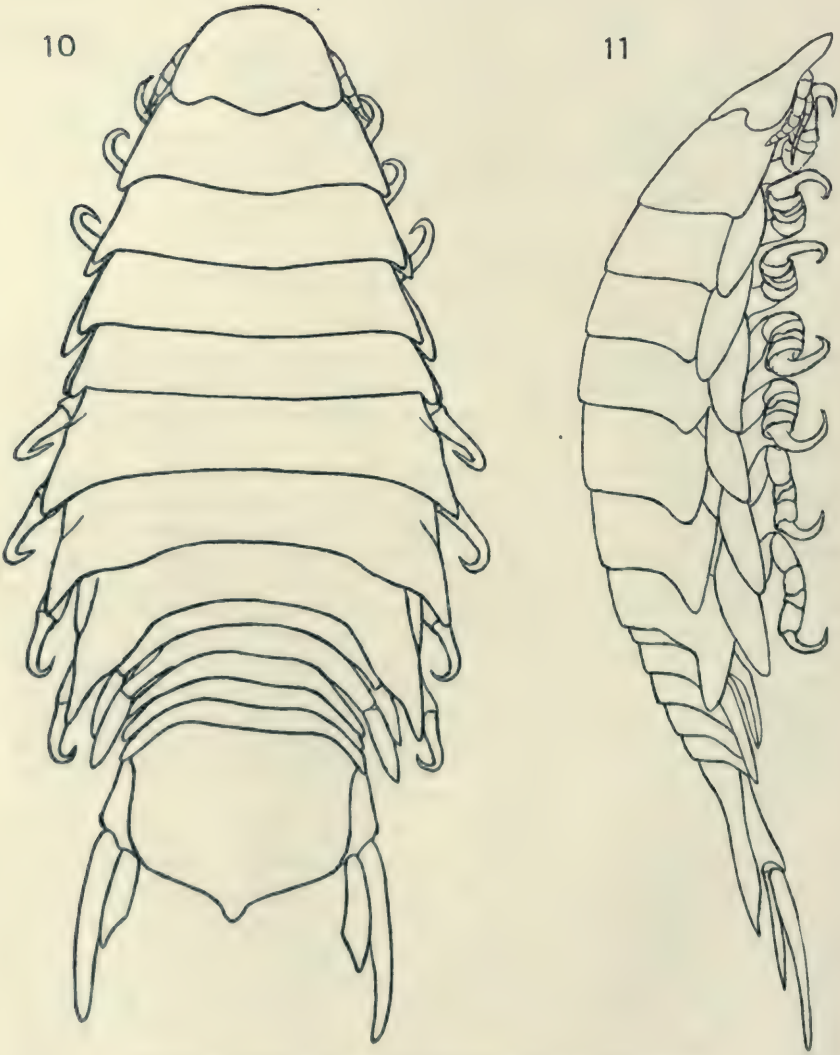
Nerocila rhabdota Kœlbel

Text Figures 10 and 11

Nerocila rhabdota Kœlbel, 1879, Sitzungsber. Akad. Wiss. Wien, (math.-nat. Kl.), LXXVIII, p. 409, Pl. ii, figs. 2*a*–2*c*. Schiœdte and Meinert, 1881, Naturh. Tidsskr., (3) XIII, p. 39, Pl. ii, figs. 5, 6. Barnard, 1914, Ann. South African Mus., X, p. 371.

This species is readily distinguished from *N. cephalotes* by the lateral angles of the main portion of the thoracic segments, which are produced backward (more conspicuously in old than in younger individuals). Those of the more anterior segments are only slightly extended but the posterior ones are produced into conspicuous triangular processes. These processes, and also the more elongate and pointed form of the epimera, affect somewhat the general outline of the body when seen from above and are, of course, still more conspicuous when seen from the side. Among other less striking differences separating the two species are the more complete disappearance of the eyes in adults of the present species, the larger and less angular median projection at the tip of the abdomen, the longer processes at the lateral ends of the first two abdominal segments and the narrower inner branch of the uropoda. The general resemblance between the two species, including size and color, is so close that it will be unnecessary to give a more detailed description here.

This species also will be found carefully described and figured in Schiœdte and Meinert's work. It was described by Kœlbel from a specimen taken from the pectoral fin of the fish *Psettus sebœ* from the coast of Senegal. Schiœdte and Meinert's description and figure are based on a re-examination of Kœlbel's type, which measured 25 mm. long and appears to have been a somewhat older individual than any of those collected by the Congo Expedition. Schiœdte and Meinert do not appear to have had any other specimen. The species has recently been reported from South Africa by Barnard (1914). Four individuals (Cat. No. 3237) of this species were picked out from among the numerous specimens of *Nerocila cephalotes* taken from market fishes (chiefly *Caranx*) at St. Antonio, August 1915. The largest of them (Figs. 10



Figs. 10 and 11. *Nerocila rhabdota* Kœlbel, 1879. Female, × 5.4.

and 11) measures 22 mm. long. It has no brood-pouch but numerous small, brown eggs are cemented to the posterior thoracic legs and some of the pleopods and adjacent parts of the ventral regions of the body. Another example, though not quite so large, has a well-developed brood-pouch. The other two are not fully adult.

The smaller number of specimens obtained indicates that it is a much less common species than *N. cephalotes*.

Nerocila acuminata Schiœdte and Meinert, 1881, from the southern United States and West Indian region, is a closely allied species.

Cymothoa plebeia Schiœdte and Meinert

Text Figures 12 and 13

Cymothoa plebeia Schiœdte and Meinert, 1884, Naturhist. Tidsskr., (3) XIV, p. 236, Pl. IX, figs. 1, 2.

A single male, apparently fully adult, was collected by the Expedition.

The body as seen from above is oblong, widening somewhat toward the rear, though the last thoracic segment is a little narrower than the sixth. Abdomen deeply set into the thorax, narrow in front, widening very rapidly to the large terminal segment, which is but little narrower than the thorax. Seven thoracic and six abdominal segments distinct and separate.

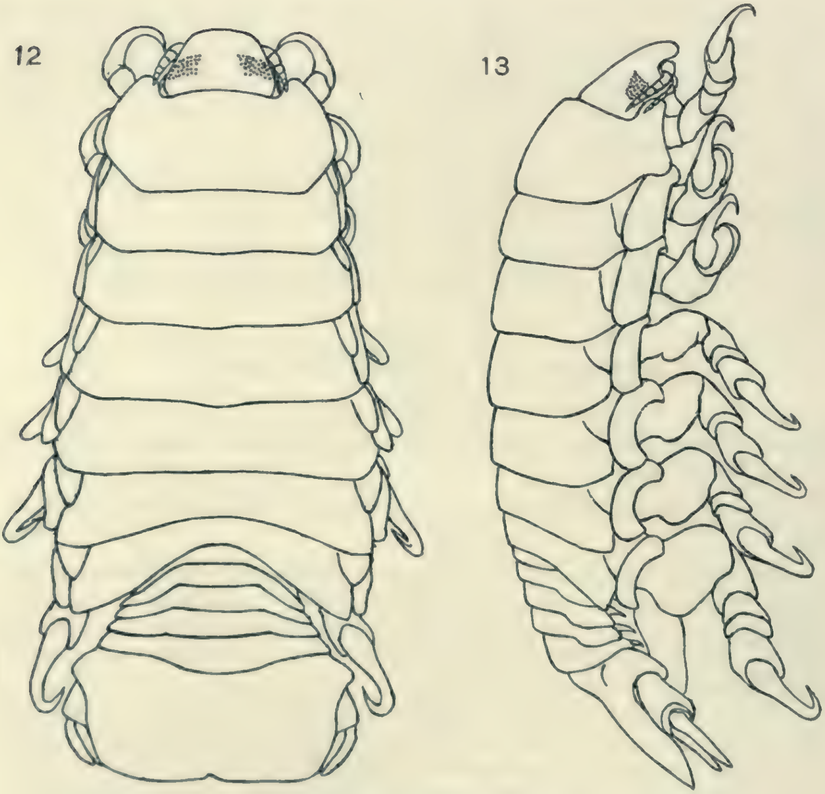
Head somewhat triangular, broader at the posterior end than it is long, with sides that converge toward the front, which is rounded and bent downward in the middle over the bases of the antennæ. The latter are cylindrical; the first antennæ are much stouter and a little longer than the second, and arise widely separated from each other; both pairs have eight segments. Rudimentary eyes are present in the form of rather large, irregularly quadrilateral spots containing some dark gray or blackish pigment.

The first segment of the thorax is not emarginate in front; it has no raised or thickened lateral borders. The processes that extend forward each side of the head are rather short (scarcely a third the total length of the head) and somewhat triangular, with a rounded apex. No peculiarities were noted in the epimera or thoracic limbs; the posterior four pairs have the basis keeled.

Last segment of abdomen large and broad; practically smooth above; its posterior border nearly transverse, with rounded corners and a slight median notch. The second pleopoda have a straight styliform process as long as, or slightly exceeding, the foliaceous part of the appendage. The branches of the uropoda are small and narrow and curved inward; they scarcely reach the end of the abdomen.

Size: 19 mm. long; maximum width, 8.3 mm. Color, in alcohol, yellowish, not pigmented.

The specimen (Cat. No. 3263) was collected at Malela and, according to the label, came from the inner side of the gills of a marine fish.



Figs. 12 and 13. *Cymothea plebeia* Schiœdte and Meinert, 1884. Male, × 5.6.

Schiœdte and Meinert describe this species from a single female from Cape Verde, the male being unknown. Making the necessary allowance for sexual difference, the agreement of the present specimen with their species seems satisfactory.

Ichthyoxenos expansus, new species

Text Figures 14 and 15

The only specimen is a female which is nearly if not quite adult, as the brood-pouch is large and well distended.

The body is symmetrical and broadly elliptical in outline. Its width slightly exceeds two-thirds its total length, and the head and abdomen are deeply set into the thorax; the back is only very moderately arched with a somewhat flattened

14

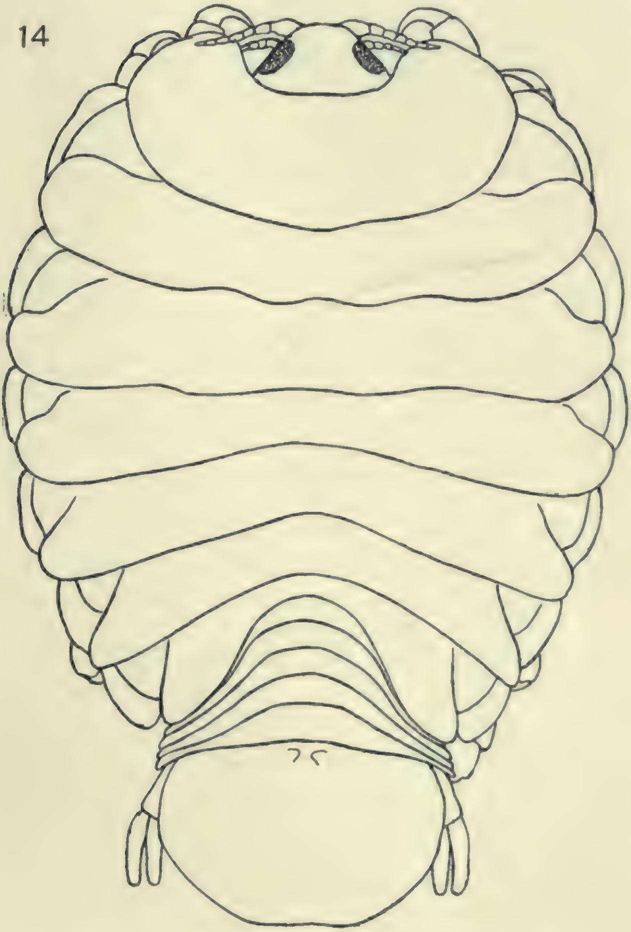


Fig. 14. *Ichthyoxenos expansus* new species. Female, × 7.5.

curvature; its surface is smooth and shining in spite of some minute irregular sculpturing visible only on magnification. Seven thoracic and six abdominal segments are distinct and separate.

Head small, so deeply set back in the thorax that it projects but little beyond the general outline of the body, its dorsal surface so inclined as to be directed forward rather than upward. Seen from above, it appears triangular with the front rounded off; from in front it is more nearly square. The eyes are fairly large, laterally placed elliptical areas of blackish pigment. Antennæ cylindrical; the first pair arise well apart and have but seven segments, of which the basal one is somewhat swollen. The

15

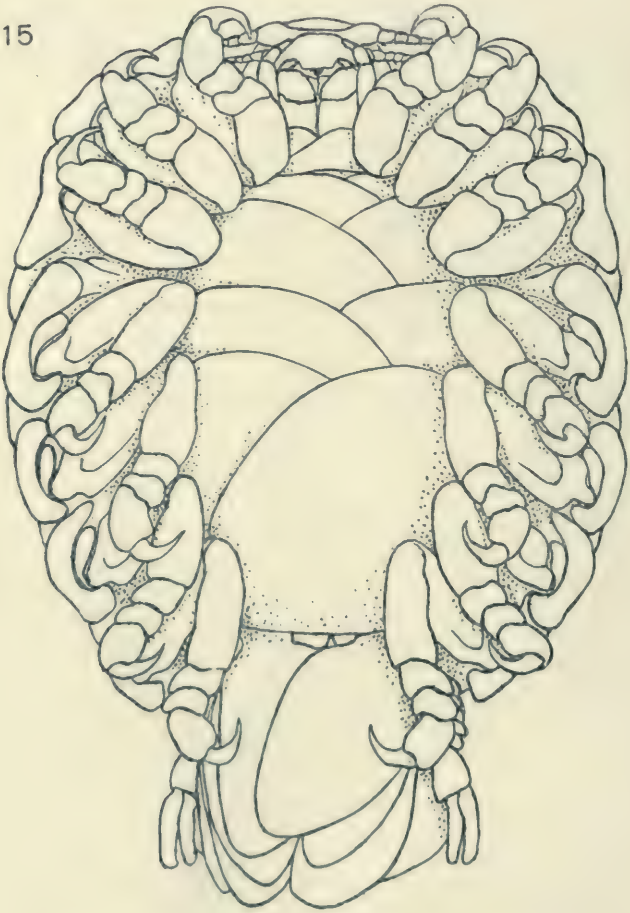


Fig. 15. *Ichthyoxenos expansus*, new species. Female, × 7.5.

second pair are slenderer and a little shorter, but likewise have seven segments. Mandibular palps long and tapering and composed of three segments. Maxillipeds without a foliaceous plate; they have palps of two flattened articles.

The thorax comprises by far the greater part of the body; the first segment is very large, semicircular as seen from above, with its anterior margin hollowed out in the median part to receive the head. The lateral ends (directed forward and slightly outward) are rounded off but not produced into projecting lobes. The remaining segments decrease successively in length (when measured on the mediam line) except the fourth, which is shorter than would be expected from its place in the series. The seventh is very short on the median line on account of the very deep excavation of its posterior border to receive the abdomen, but it is quite wide at the ends, which are directed almost backward and reach near to the anterior margin of the terminal abdominal segment. Epimera distinct on all the thoracic segments except the first; they are thick and crescent-shaped, but do not reach quite as far back as the posterior corners of their segments. The latter are rounded off and not produced. The legs are all much alike except for a gradual increase in length toward the posterior end of the body. They are of the usual prehensile type, ending in fairly large, curved claws. Their basal segments are not conspicuously keeled.

Abdomen short and rather narrow, especially anteriorly, set into the thorax nearly to the base of its terminal segment, which is large and broad, rounded behind, and longer than the other five abdominal segments taken together. These latter increase in length from the first to the last; they are short longitudinally and extended transversely, their lateral parts being closely crowded together and not produced. The pleopoda are large and leaf-like, of ovate outline and smooth-edged. The uropods are small; their branches, which do not reach as far back as the end of the last segment, are rather narrow and of about equal length and rounded at the tip. The outer one is slightly curved inward; the inner one is straight.

Total length of specimen, 16 mm.; width, 11 mm. Color, in alcohol, yellowish, with a few faint and very minute dark pigment-spots on the head and fore part of the first thoracic segment.

The single specimen (Cat. No. 3261. Type) was taken from the gills of a characinid fish (*Eugnathichthys eetveldii* Boulenger, 1898) about one foot long, collected at Poko on one of the tributaries of the Uele River, July 1913.

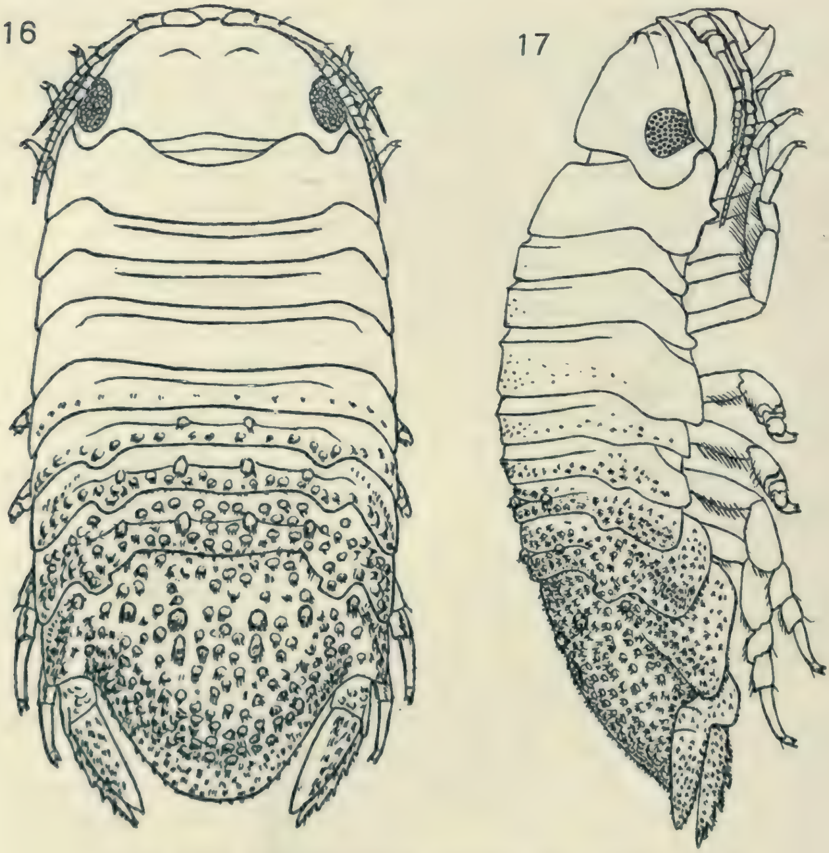
Herklots (1870) described the type species of this genus, a parasite on a river-fish of Java. Schiœdte and Meinert (1884) added a second species from the Himalayas, and Richardson (1913, Proc. U. S. Nat. Mus., XLV, pp. 559–562), a third from a Japanese fresh-water fish. Another Japanese species has been added by Ishii (1916, Annot. Zool. Japon., IX, pp. 125–131, 10 figs.). Except that the present form has the first antennæ a little dilated at the base, it agrees well with the generic characters assigned by Schiœdte and Meinert, though its widely separated habitat may arouse a suspicion that we have here not a natural genus but a case of convergence of species that have evolved separately from related marine forms, perhaps those of the genus *Livoneca*, from which *Ichthyoxenos* is distinguished by only very slight characters.

Sphæromidæ

Sphæroma destructor Richardson

Text Figures 16 and 19

Sphæroma destructor Richardson, 1897, Proc. Biol. Soc. Washington, XI, pp. 105–107; 1900, Amer. Naturalist, XXXIV, p. 223; 1901, Proc. U. S. Nat. Mus., XXIII, p. 534; 1905, Bull. U. S. Nat. Mus., No. 54, p. 282, figs. 294–298.



Figs. 16 and 17. ***Sphæroma destructor*** **Richardson, 1897. Female, × 11.5.**

(?) *Sphæroma terebrans* Bate, 1866, Ann. Mag. Nat. Hist., (3) XVII, p. 28, Pl. i, fig. 5.
Sphæroma terebrans Stebbing, 1904, Spolia Zeylanica, II, part 5, p. 16 (in part).
Hansen, 1905, Quart. Journ. Micr. Sci., XLIX, part 1, p. 116 (in part).
Stebbing, 1908, Ann. South African Mus., VI, pp. 48, 49, 427 (in part); 1911, Rec. Indian Mus. Calcutta, VI, pp. 181, 182 (in part).

The body is stout, short, and highly arched; in its general outline and in its power of rolling into a ball superficially resembling some of the terrestrial isopods. The dorsal surface is granular, on the posterior half of the body the granules are coarse and the larger ones bear tufts of minute hairs to which mud adheres. The thoracic segments, especially the fourth and fifth, have on the dorsal part a well-marked transverse ridge, and more or less well-developed paired tubercles are present on the last one or two of the thoracic and on the abdominal segments, of which there are but two in this genus. The posterior end of the abdomen is broad and obtuse; its posterior lateral margins are conspicuously bent upward.

The first and second antennæ have flagella with 8 or 9 and 12 or 13 articles respectively.

The first legs have a short spine on the inner distal end of the propodus. It is present in both sexes but is wanting on the other legs. All the legs, however, including the first, have a short rounded extension of the posterior aspect of the propodus, which overlaps the base of the dactylus.

The number of teeth on the outside edge of the external branch of the uropoda has been used as a distinguishing character in the species of this group. The Congo specimens indicate that it is not reliable for such a purpose. They have from three to five well-formed teeth in addition to the apical point. The proximal tooth is often so reduced as to make it doubtful whether it should be counted or not, or it may be poorly developed or wanting on one side only.

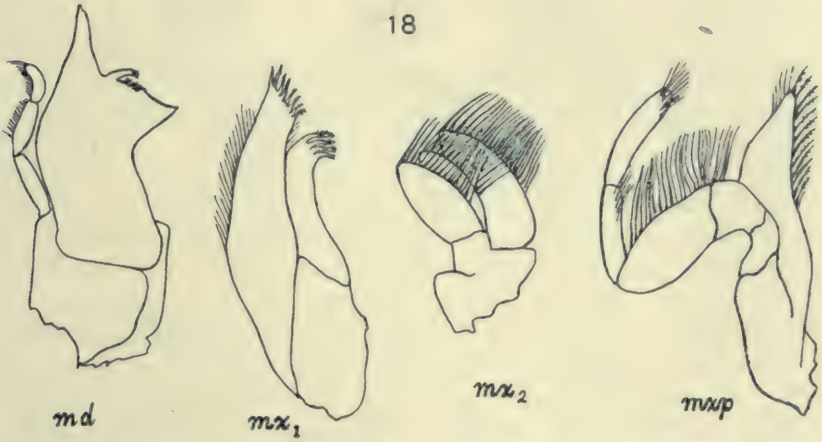


Fig. 18. *Sphæroma destructor* Richardson, 1897. Mouth-parts of female, × 24.

The drawings here reproduced are from a female. The males are, however, closely similar in general form, size, and appearance, but, as a rule, have the tubercles of the dorsal surface a little more prominent. Often there are fairly well developed tubercles on the sixth as well as the seventh thoracic segment and one or two pairs of small tubercles posterior to the central pair on the last abdominal segment. The males also have the postero-lateral borders of that segment more broadly and conspicuously turned up than the females. This gives the posterior end of the body a slightly narrower outline as seen from above.

A more detailed description can be found in Richardson, 1905.

The largest individuals measure 9.5 mm. to 10 mm. long to the tip of the abdomen. Their color varies from yellowish to a fairly dark brown or greenish brown, the color being due to minute, irregularly branching pigment-spots.

About two hundred specimens (Cat. Nos. 3236 and 3245) were collected in submerged mangrove roots in certain creeks near Banana, where the water is quite strongly saline. Mr. Lang states that, though

19

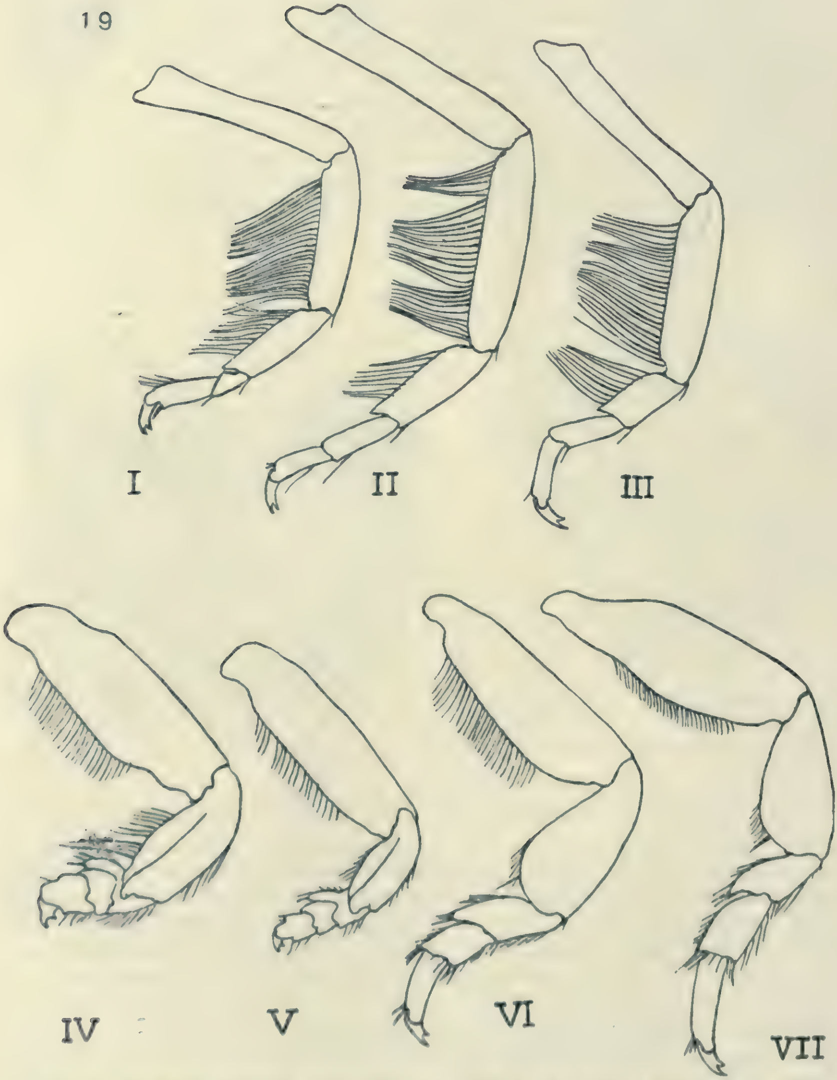

I
II
III
IV
V
VI
VII

Fig. 19. *Sphæroma destructor* Richardson, 1897. Legs of right side of female, external aspect, × 18.

abundant, its distribution was very local and that it was wanting from many apparently favorable stations in the vicinity, also that their burrows in the roots extended to, if not actually into, the sound and living parts of the roots, appearing to cause their progressive death and decay.

I have been unable to find any material differences separating the Congo Expedition specimens from Richardson's *S. destructor* described from Palatka, Florida, as far as the careful descriptions and figures given by that authority enable me to judge, in spite of the fact that the Florida specimens must have been from completely fresh water while the Congo specimens, as is shown by their boring in mangrove roots, lived in quite strongly saline water. Stebbing (1904) has reduced *S. destructor* to a synonym of *S. terebrans* Bate, 1866, from Brazil. The explanation he gives of the peculiarity in the mandibular palpus in *S. erebrans* as shown by Bate's figure is a very plausible one and, with this difficulty removed, the reasons against accepting Stebbing's view do not seem at all conclusive. Nevertheless, as Miss Richardson's species is based on a full description and a number of careful figures, it would be neither just nor safe to displace it until more is known about the Brazilian form.

Stebbing in the same article also reduces *S. vastator* Bate, 1899, from India, Ceylon, and South Africa (see also Stebbing, 1908, p. 49) to a synonym of *S. terebrans*. There are a few South African specimens in the American Museum collection (Cat. No. 54) from the piling of a bridge over the Isipingo River, Natal, which probably represent *S. vastator*. A comparison of these with the Congo specimens shows the resemblance to be very close. The tubercles of the back are slightly more prominent, the last segment of the abdomen is a little narrower and more angular in outline, and the legs are possibly a little stouter in the Natal specimens, but the differences are of a very slight and relative character and, without additional material, I am unable to decide how much importance should be attributed to them. *S. bigranulatum* Budde-Lund (1908, p. 304, Pl. XVII, fig. 55) from Zanzibar can hardly be a synonym of *S. vastator*, unless considerable allowance is to be made for inaccuracy in the figure of it published in that work.

Superfamily **BOPYROIDEA** (= Epicaridea)

Bopyridæ

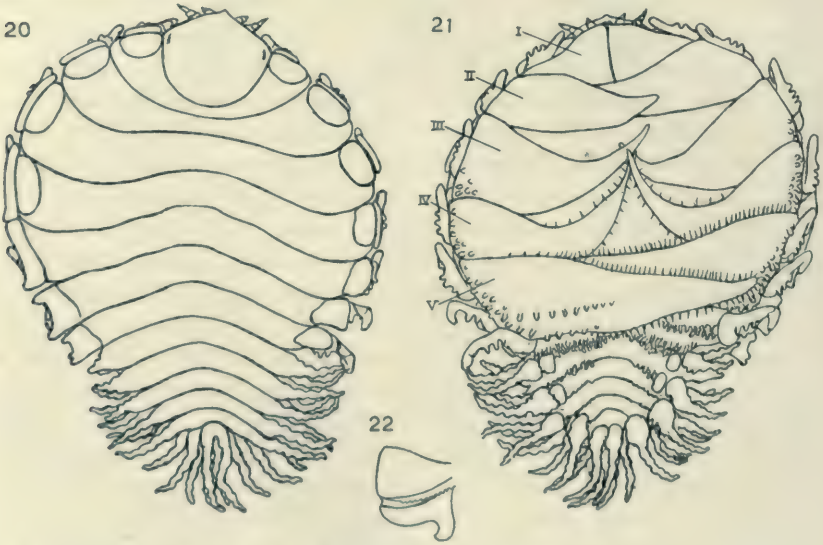
Pleurocrypta langi, new species

Text Figures 20 to 22

But one specimen of this species was obtained, a female probably not fully adult, having a large but empty and not completely closed brood-pouch.

Body as seen from above very widely oval, the widest part far forward; the anterior end very broadly rounded, the posterior end narrow. Outline conspicuously asymmetrical, the convexity of the axis being toward the left side. Seven thoracic and six abdominal segments are distinct and separate. Dorsal surface flat and smooth; the lateral bosses (present on the four anterior body segments) are rather small. Length of body to tip of abdomen, 4.8 mm.; width, 4 mm.

Head narrow, but little wider than long, deeply set back into the thorax; the posterior border quite evenly curved, the anterior obtusely triangular with convex sides and a minute rounded median projection or rostrum at the apex. Its anterior border extends conspicuously out beyond the general outline of the front end of the body. Rudiments of eyes in the form of elongate spots of pigment are present. Antennæ well developed, the first with three, the second with at least five distinguishable segments.



Figs. 20 to 22. *Pleurocrypta langi*, new species.
20 and 21. Dorsal and ventral aspects of female, × 12.
22. First opercular plate of left side, ventral aspect, × 9.

First thoracic segment very short on the median line, longer at the ends; the third segment is the longest and from that point the thoracic and abdominal segments diminish fairly regularly in length to the posterior end of the body. The epimera of the first four body segments are narrow borders, only the fourth is of the full length of the end of the segment. The epimera of the fifth, sixth, and seventh are successively wider and are as long as the segments; they end off squarely but have the anterior and posterior lateral angles projecting a little; the seventh has a small additional tooth just anterior to the posterior lateral angle. (This description is of the left side, the epimera of the right side are not well developed.) Legs of the prehensile type, moderately long for an animal of this group; minute claws appear to be present, at least on some of them. The basis of these limbs has a dentate crest, and this and other proximal segments of these limbs have a few irregular papilla-like projections on the external aspect.

The first five abdominal segments have their lateral ends extended into tapering flexible processes whose borders are coarsely and simply toothed or deeply sinuate; these processes or extensions of the segments show evidence of incomplete segmentation in some of the narrow constrictions caused by the indentations. The pleopoda of these segments consist of two branches each, their basal portion is a mere projection on the surface of the abdomen of irregular, somewhat papillated outline; the branches are both similar in character and size to the above described lateral processes of the segments. The sixth abdominal segment is very small and its lateral ends bend directly backward. They are extended into processes similar to those of the other segments and to the branches of the pleopoda. Uropoda, if not wanting, must be represented by these extensions of the sixth segment, for all other appendages appear to belong to the other five segments, though their crowded condition makes this difficult to demonstrate.

Brood-pouch large, composed of five pairs of plates. Except the specially modified first pair (see Fig. 22), they end in tapering points which overlap but do not completely close the pouch. The last two pairs bear short hairs along the edges.

Many parts of the body are studded with small, irregular, rounded projections or papillæ. They are present, as already mentioned, on the proximal segments of the legs and occur also in abundance on the ridges marking the abdominal segments on the ventral side of the body between the pleopoda, on the bases of the latter, and a few even on the proximal parts of the exposed surfaces of some of the plates of the brood-pouch, especially on the fifth pair.

Color, in alcohol, yellowish, without pigment-spots.

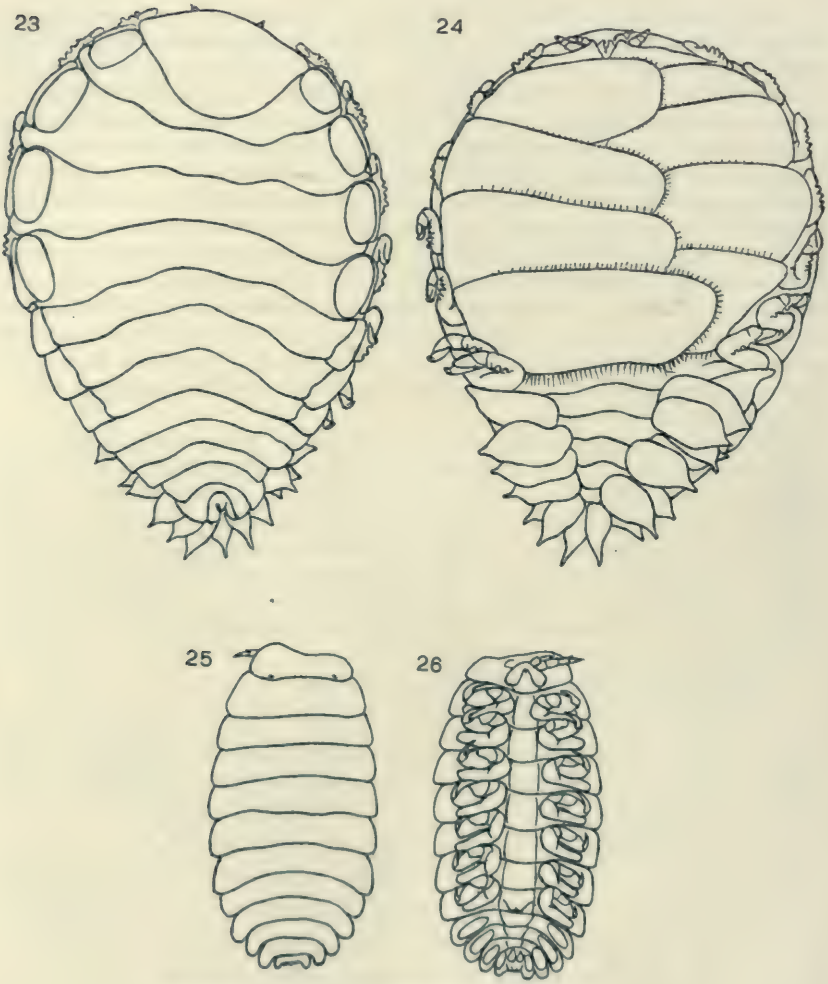
The only specimen (Cat. No. 3246) was found in the branchial chamber of an *Upogebia furcata* (Aurivillius) collected at Banana, July 1915, one of the same lot in which *Pseudione chapini*, new species, was found.

Only the female sex being represented, and that by a single individual which is perhaps not fully adult, the generic position of this species is difficult to determine, though it seems to be an undescribed form. Of the genus *Pleurocrypta* Hesse, 1865, in which I have included it provisionally, Bonnier (1900, p. 310) says that the known species are parasites of Anomala of the genera *Galathea* and *Porcellana*, and that two undescribed species have been reported parasitic on Paguridæ. Several members of the family Bopyridæ have been recorded as branchial parasites of *Upogebia*. Three are enumerated by Nobili (1906) and another is added by Hay (1917). The present collection adds two.

Pseudione chapini, new species

Text Figures 23 to 26

There are two well-preserved females in the collection, both similar in size and characters.



Figs. 23 to 26. ***Pseudione chapini*, new species.**
23 and 24. Dorsal and ventral aspects of female, × 9.
25 and 26. Dorsal and ventral aspects, of male, × 18.

Body as seen from above broadly oval in outline, narrowing rapidly but evenly toward the posterior end, which is rounded. Both specimens strongly asymmetrical, one with the axis convex toward the left, the other with it convex toward the right side.

Dorsal surface flat and smooth; lateral bosses are developed on the first four body segments. Seven thoracic segments and six abdominal segments are distinct and separate.

Head wider than long, deeply set back in the thorax; its anterior border is without a raised or thickened edge and is slightly convex in outline, conforming to the general oval curve of the body. No eyes; antennæ very short, the first pair with three, the second with four segments distinguishable.

First thoracic segment very short in the median part; the fourth is the longest; the succeeding thoracic and abdominal segments diminish quite regularly in length toward the posterior end. Lateral parts of the more posterior segments of the body bent backward, the last two or three very strongly so. Epimera of first four thoracic segments very distinct but narrow and shorter than the segment; those of the fifth, sixth, and seventh are wider and as long as the segment, but so fused with it that the line of union is more or less indistinct. The lateral ends of the thoracic and abdominal segments and their epimera conform to the general body outline, being slightly rounded or nearly square without produced angles.

Brood-pouch covering the entire lower part of the thorax but leaving the mouthparts exposed. Legs small and weak, particularly those of the anterior part of the body. Basis of limbs not strongly keeled, but one or more of the proximal segments of each limb bear on the outer aspect a number of small, irregular, papilla-like or tooth-like projections quite conspicuous under moderate magnification.

The pleopoda each consist of two broad leaf-like divisions; these have the base rounded, the edges smooth, and they end in an acuminate tip. Uropoda similar to the pleopoda but consisting of one division only.

Length of largest female 7.1 mm.; width 5.2 mm. Color in alcohol yellowish, without pigment-spots.

A male individual was found clinging to the lateral ventral part of the abdomen of one of the females. It is only 2.3 mm. long, of elliptical outline when seen from the dorsal side, and little more than half as wide as it is long. It deviates very little in shape from the usual isopod type seen in many of the terrestrial Isopoda and, except that one side of the head is less developed than the other (the two antennæ of that side being wanting), the body is very nearly symmetrical. This peculiarity of the head is doubtless merely an individual one, caused by some accidental injury.

The head is wide, its posterior margin nearly transverse; it bears on the dorsal surface near the posterior margin a pair of minute, widely separated eye-spots. The first antennæ are very short and small; three segments are distinguishable in them; the second antennæ are considerably longer and have five segments, the last one ending in a pair of spines or short stiff hairs.

All the seven thoracic segments are separate and do not vary very greatly in length; the first is, however, somewhat longer and the seventh somewhat shorter than the others. Five separate abdominal segments are readily distinguishable, becoming very small toward the posterior end of the body; their lateral extremities are rounded and bent backward. This reduced number of abdominal segments would place the species in the genus *Parione*, Richardson (1910, p. 39). The tip of the abdomen is, however, in a more or less abortive condition in this family, and I cannot regard the exact extent to which this process has gone as affording any evidence of relationship or any secure basis for generic distinctions.

Thoracic limbs all well developed; the anterior ones are short and stout, of the usual prehensile type and end in fairly long, slightly curved claws; the posterior ones are similar but less stout, and the claws are much smaller and shorter. The five pairs of abdominal limbs are reduced to fleshy lobes, which probably serve chiefly as respiratory organs.

Color (in alcohol), yellowish.

Two adult and well-preserved females, to one of which the male was clinging (Cat. No. of all the specimens 3247; the larger female is the type) were obtained from the branchial chambers of specimens of *Upogebia furcata* (Aurivillius), a thalassinid crustacean about one inch long which burrows among the roots of mangroves, in July 1915, near Banana. There was but one female in each host. Two more specimens of the host in the same lot had bopyrid parasites (in one case one on each side of the body) that were very likely of this same species but that were in too advanced a state of disintegration to make out much of their structure.

I have not been able to identify this with any previously described form. It is closely allied to both the American species *P. furcata* and *P. curtata* Richardson, 1904 (see Richardson, 1905), but is distinguishable from the former by the absence of a raised margin on the front of the head and by the wider pleopoda and from the latter by the form of the abdominal segments in both sexes, also apparently from both by the presence of papillæ on the legs, which Richardson does not mention. But some of these differences appear to be of slight importance, and the validity of species so separated cannot be regarded as well established. *P. upogebiæ*, Hay, 1917, from South Carolina, which, as its name shows, is also parasitic on a *Upogebia*, differs in having the pleopoda provided with digitate processes, as well as in other characters. Two other species of this genus have been described as parasitic on European species of *Callianassa*, a genus of burrowing Macrura allied to *Upogebia*. These are *Pseudione callianassæ* Kossmann, 1881, and *P. dohrni* Giard and Bonnier, 1890. The latter differs in having the pleopoda with thickened papillated margins; the former has been too incompletely described and figured to be taken into consideration here.

Superfamily **ONISCOIDEA**

Ligydidæ

Ligyda exotica (Roux)

Text Figures 27 to 30

Ligyda exotica Richardson, 1905, Bull. U. S. Nat. Museum, No. 54, p. 676, figs. 716–718; 1910, Marine Isop. Philippines, p. 41; 1910, Proc. U. S. Nat. Mus., XXXVII, p. 125.

Ligia exotica Roux, 1828, Crust. Médit., p. 3, Pl. xiii, fig. 9. Milne-Edwards, 1840, Hist. Nat. Crust., III, p. 157. Budde-Lund, 1879, Prospectus gen. spec. Crust. Isop., p. 8; 1885, Crust. Isop. Terrestr., pp. 266–268. Dollfus, 1890, Bull. Soc. Etud. Sci. Paris, XII, p. 7 (in part); 1893, Bull. Soc. Zool. France, XVIII, p. 189; 1893, Feuill. d. jeun. natur., XXIV, p. 24 (in part); 1897, idem, XXVII, p. 211 (int part); 1898, Bull. Soc. Zool. France, XXIII, p. 126. BUDDE-LUND, 1898, Deutsch Ost-afrika, IV, part 8, p. 10. RICHARDSON, 1899, Proc. U. S. Nat. Mus., XXI, p. 866. DOLLFUS, 1899, Proc. 4th Int. Zool. Congress, Cambridge, pp. 255, 256, 260. RICHARDSON, 1899, Ann. Mag. Nat. Hist., (7) IV, p. 335; 1900, Amer. Naturalist, XXXIV, p. 306. STEBBING, 1900, in Willey, Zool. Results, part 5, p. 646. RICHARDSON, 1901, Proc. U. S. Nat. Mus., XXIII, p. 575; 1902, Trans. Conn. Acad. Sci., XI, pp. 306–308, Pl. XL, figs. 62*a*, 62*b*. GOTO, 1906, Annot. Zool. Jap., V, pp. 267-281. DOLLFUS, 1907, Ergeb. Reise Niederl. Ost-Indien, IV, p. 381. BUDDE-LUND, 1908, in Voeltzkow, Reise in Ostafrika, p. 303; 1913, Trans. Linnean Soc. London, Zool., (2) XV, p. 391. CHILTON, 1916, Mem. Ind. Mus. Calcutta, V, p. 462, figs. 1–22; TERAO, 1915, Dobuts. Zool. Tokyo, XXVII, p 47.

? *Ligia grandis* PERTY, 1830–34, Delectus animalium articulatorum, p. 212, Pl. XL, fig. 113.

Ligia gaudichaudii MILNE-EDWARDS, 1840, Hist. Nat. Crust., III, p. 157. NICOLET, 1849, in Gay, Hist. Chile, III, p. 265. DANA, 1853, U. S. Exploring Exp., Crust., p. 741, XLIX, figs. 6*a*–6*h*.

? *Ligia* (*italica*) *coriacea* KOCH, 1835–44, Deutschlands Crust., p. 36; Berichtig., p. 211.

? *Ligia baudiniana* MIERS, 1877, (not Milne-Edwards, 1840), Proc. Zool. Soc. London, p. 670.

Ligia malleata PFEFFER, 1889, Jahrb. Hamburg. Wiss. Anst., VI, p. 36.

This widely distributed form is too well known to require an extended description here. Exclusive of the long slender uropoda, the body may reach a length of 30 mm. but none of the Congo Expedition specimens exceed 24 mm. in length in the case of male individuals, or 21 mm. in the case of females. In the alcoholic specimens the ground color is a light greenish yellow, which under moderate magnification is seen to be thickly dotted with minute, irregularly branched spots of dark pigment. These, becoming more thickly distributed on the dorsal parts of the body, give the animal a mottled greenish gray or slate color, which is, however, paler on the lateral parts of the epimera, so that the body has a lighter border along the sides.

Among the principal specific characters are the form of the body, which widens rapidly in the anterior part of the thorax and then tapers gradually to the last segment of the abdomen; the soft integument and the loose articulation and fragility of the segments of the body and their appendages (few specimens reach the museum with the uropoda and antennæ attached and unbroken); the large epimera separated from the body of the segment by a distinct suture; the large bulging eyes; very long antennæ and uropoda; and the distinct, though obtuse, angle at the tip of the abdomen. The males have on the distal end of the first leg a small flattened lateral process which overlaps the base of the dactylus on the posterior aspect of the limb. The inner edges of the carpus and merus of this limb are devoid of spines and are roughened with minute file-like oblique ridges. In the female the corresponding limb is more slender and lacks the lateral process and the ridges, but is provided with a number of spines in the position of the latter. The dorsal surface of the body is more conspicuously granulated than in *L. olfersii.*

27

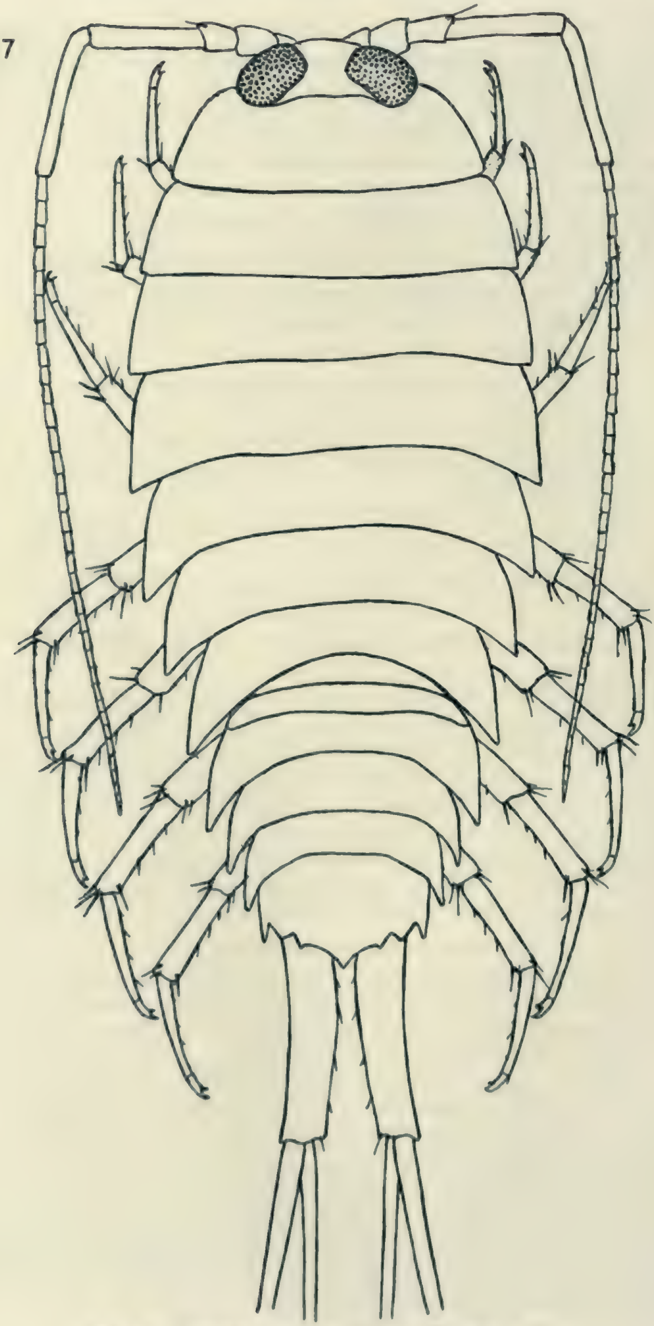
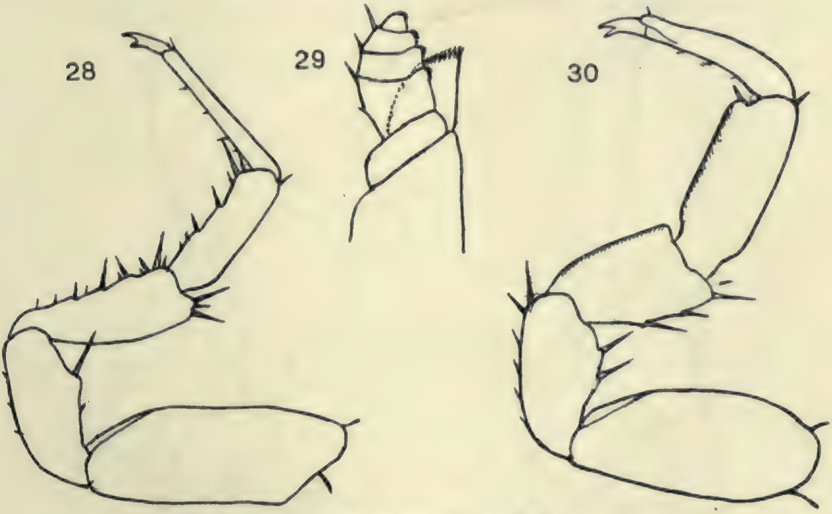


Fig. 27. *Ligyda exotica* (Roux), 1828. Female, × 0.7.

A large male specimen, 24 mm. long, has thirty-one articles in the flagellum of the second antennæ. These reach a little way beyond the posterior end of the abdomen when well drawn back. In another male, 21 mm. long (36.3 mm. long inclusive of the uropoda), the flagellum of the second antennæ has thirty-three articles. The terminal branches of the uropoda are 9.8 mm. long. In one of the larger females (length, 18 mm.; inclusive of uropoda, 29 mm.) the flagellum of the second antennæ has thirty-three articles. The antennæ reach a little beyond the end of the abdomen when well drawn back, and the terminal branches of the uropoda are 7.5 mm. long. In another female (length, 17.5 mm.; inclusive of the uropoda, 28 mm.) the terminal branches of the uropoda are only 6.3 mm. long.



Figs. 28 to 30. *Ligyda exotica* (Roux), 1828.
28. First leg of right side of female, internal aspect, × 15.
29. Tip of inner division of right maxilliped of male, × 15.
30. First leg of right side of male, internal aspect, × 12.

For a more detailed description of this species, with numerous figures and a discussion of its relationships, see Chilton, 1916.

This isopod is found creeping or running on moist rocks, piles of wharves, bridges, etc., or hiding in their crevices just above the water on the coasts of most of the tropical and warmer regions of the world. Its wide distribution may be in part due to its accidental dispersal through commerce. It has already been reported from Senegal (Dollfus, 1897) and from the eastern coast of Africa. Over fifty specimens (Cat. Nos. 3235 and 3238) are contained in the Congo Expedition collection, all obtained along the shore at Banana from stones and rocks near brackish water in August 1915.

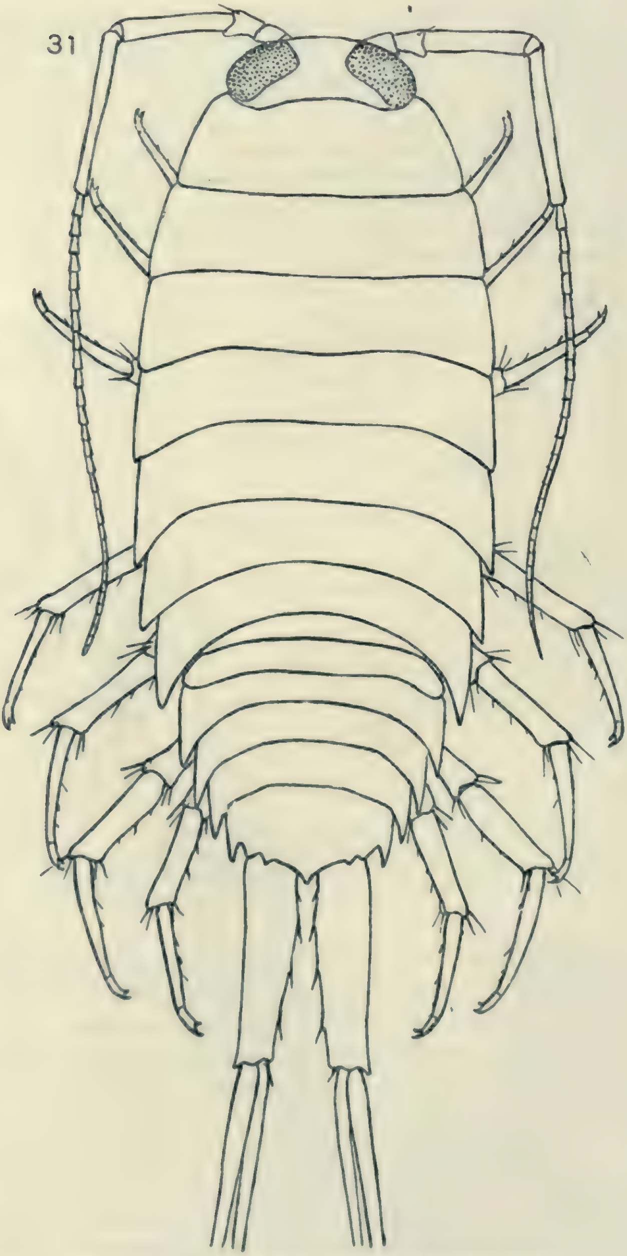


Fig. 31. *Ligyda olfersii* (Brandt), 1833. Female, × 6.7.

Ligyda olfersii (Brandt)

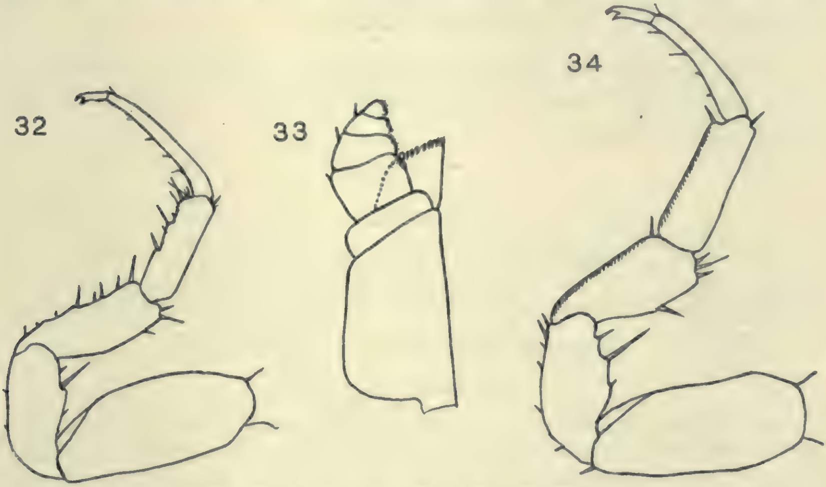
Text Figures 31 to 34

Ligia olfersii Brandt, 1833, Bull. Soc. Imp. Nat. Moscou, VI, p. 11. Budde-Lund, 1885, Crust. Isop. Terrestr., p. 268. Richardson, 1901, Proc. U. S. Nat. Museum, XXIII, p. 575. Chilton, 1916, Mem. Ind. Mus. Calcutta, V, p. 466.

Ligia exotica Dollfus, 1893, Feuill. d. jeunes natural., XXIV, p. 25 (in part); 1897, idem, XXVII, p. 212 (in part).

Ligyda olfersii Richardson, 1905, Bull. U. S. Nat. Mus., No. 54, p. 674, figs. 714, 715.

Resembles *L. exotica* in color and appearance but is somewhat smaller. The body is proportionately narrower, especially in its anterior portion, so that the outline seen from above is more nearly elliptical than oval. The surface is smoother, the granulation being very faint and inconspicuous when the specimen is wet; the eyes are more elongated and less bulging, and the epimera much more completely fused with the main parts of the segments, while the body as a whole is firmer, less fragile and more compactly articulated than in *L. exotica*. The propodus of the first pair of legs of the male lacks the lateral process at the distal end that is present in *L. exotica*, but in the male the file-like ridges on the merus and carpus, and in the female the spines, are present as in the corresponding limbs of that species.



Figs. 32 to 34. ***Ligyda olfersii*** **(Brandt), 1833.**
32. First lef of right side of female, internal aspect, × 12.
33. Inner division of right maxilliped of male, × 24.
34. First leg of right side of male, internal aspect, × 14.

Females 17 mm. to 17.5 mm. long when measured to the tip of the abdomen, have twenty-nine or thirty articles in the flagellum of the second antennæ, which, when drawn well back, reach half-way along the last abdominal segment.

A male 17 mm. long when measured to the tip of the abdomen (29 mm. long to the ends of the uropoda) has thirty-five articles in the flagellum of the second antennæ, which reach, when well drawn back, half-way along the last abdominal segment. The terminal branches of the uropoda are about 7.5 mm. long.

This species is credited by Richardson (1905) with the following distribution: Key West and Puntarasa, Florida; St. Thomas, W. I.; and Brazil. There are specimens in the American Museum collections from Andros Id., Bahamas (Cat. No. 3122) and one from Guadeloupe, W. I. (Cat. No. 3123). With the material available I failed to discover reasons for considering the Congo Expedition specimens distinct from the American ones.

The Congo specimens (Cat. Nos. 3240 and 3241), fourteen in number, were all obtained at Banana in August 1915, with *L. exotica*, and were picked out from among the lots of the latter species, from which the collectors evidently did not differentiate them.

Budde-Lund, 1885, described a species *L. gracilipes* from Senegal, which, however, is smaller and has very long uropoda, the latter exceeding the body in length.

Oniscidæ

Eubelinæ (=Eubelidæ *auct. mult.*)

The next five species all belong to the typical subgenus of *Eubelum*.

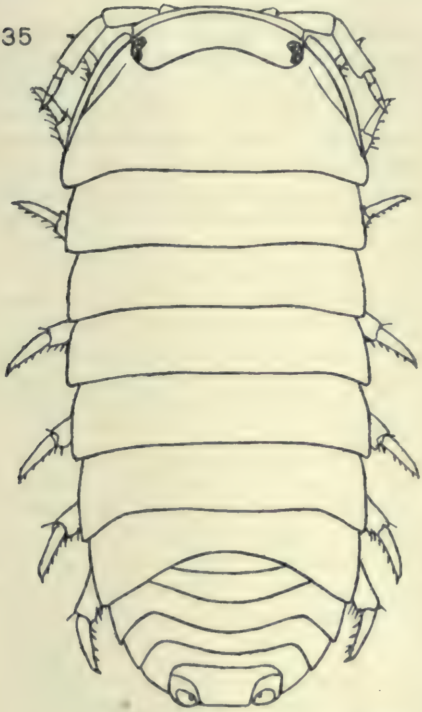
Eubelum stanleyanum, new species

Text Figures 35 to 45

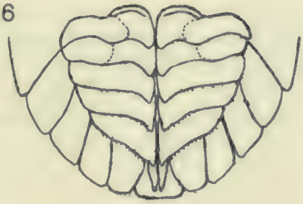
Body convex, contractile into a ball, oblong in outline when seen from above, with the sides nearly parallel except for a slight convergence toward the rear; it is of moderate width, broadly rounded in front, somewhat more narrowly so at the rear. Surface smooth, with thickly distributed minute pits, visible on magnification, but without granulation and without more than a slight trace of pubescence. Color of upper parts varying from gray to brownish with yellowish markings and margins on the segments. Some of the specimens have the epimeral parts of the segments, and most of them have the exposed parts of the uropoda, yellowish in more or less contrast to the adjacent darker parts. Under parts and legs yellowish. Size of large females about 11 mm. long; males about 9 mm.

Head of moderate width, the epistome with a rather prominent, strongly upturned superior margin; the anterior outline of the head seen from above is gently arched. Eyes rather large, with about seventeen ocelli. Antennæ short and rather stout; their first segment small and very short, their fifth segment not greatly longer than the fourth; the flagellum is rather indistinctly three-segmented, having the first and third articles about equal and considerably shorter than the second. First maxilla with eight long sharp teeth (3+5), with an additional, very small, accessory tooth beside the second tooth on the outer division, and a row of about eleven plumose processes on the inner division. These processes are so closely crowded that an exact count is difficult.

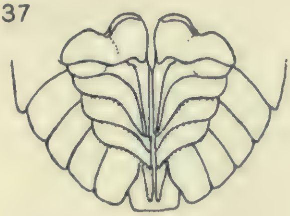
35



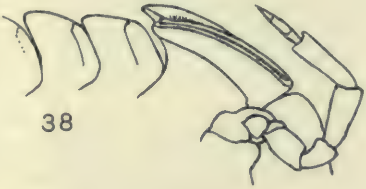
36



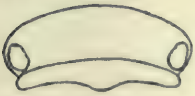
37



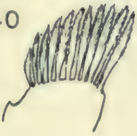
38



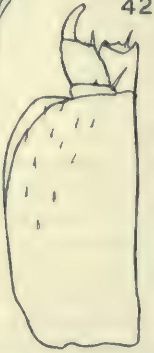
39



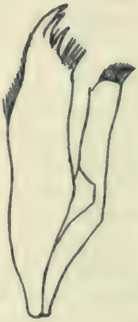
40



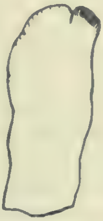
42



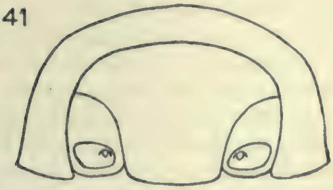
43



44

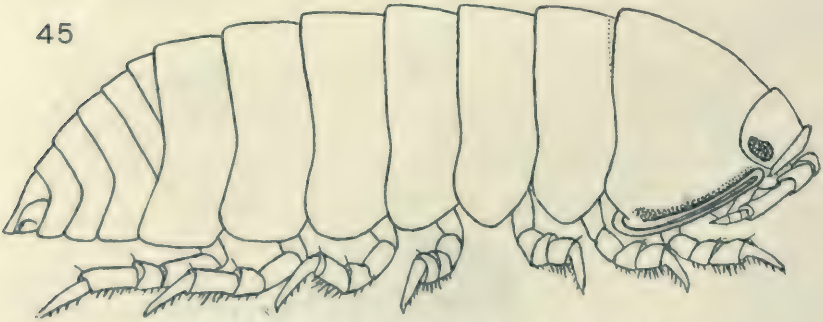


41



Figs. 35 to 44. *Eubelum stanleyanum*, new species.
35. Female, × 8.4.
36. Pleopoda of female, × 8.4.
37. Pleopoda of male, × 10.
38. Antenna and outline of anterior segments, ventral view, × 9.6.
39. Outline of head, front view, × 9.
40. Tip of inner division of first maxilla, × 100.
41. End of abdomen, posterior view, × 16.
42. Inner division of maxilliped, × 36.
43. First maxilla, × 40.
44. Second maxilla, × 36.

Posterior lateral angles of first thoracic segment little produced and rather broadly truncated in an oblique direction, with a very short cleft to receive the second segment when the body is rolled up. Lateral margin of first segment when seen from the side very gently curved; it has a wide thick projecting border extending back to the truncated part of the posterior angle. Along the whole length of this border there is a narrow sulcus on the external aspect, but so situated that it is visible in a ventral view also. The whole projecting border is sharply separated from the main part of the segment by a deep but rather widely open groove. The inner side of the cleft for receiving the second segment is more produced in an obliquely downward direction than the outer side (though hardly extending as far in a directly posterior direction), and is narrowly rounded off instead of truncated. The second and third thoracic segments have a thickening of the anterior border of the epimeral part, as though caused by an infolding of the edge, but they bear no process. The lateral ends of the second to fifth (inclusive) segments are somewhat rounded off; the sixth and seventh are more squarely cut off. Legs fairly long and moderately stout, with stout but not very numerous spines.



45

Fig. 45. *Eubelum stanleyanum*, new species. Female, × 9.6.

The form of the pleopoda is shown in the accompanying illustrations. In the female the first two pairs are more conspicuously swollen and tracheate than the others. The terminal segment of the abdomen has the median portion very wide and slightly tapering; the end is broadly and almost squarely cut off. The exposed part of the uropoda is obliquely quadrangular and somewhat elongate, its external surface only moderately convex. A large, shallow, transversely oval depression occupies much of the distal half of this surface. In, but near the margin of, this depression (well removed from both the internal and terminal margin of the basal segment) the very minute, short, rounded rudiment of the external branch is placed. The internal branches are rather narrowly tapered and do not reach to the end of the last abdominal segment.

This species would appear to be common near Stanleyville, as the following specimens were collected. Females predominate among them; some have brood-pouches containing young.

Cat. No. 3267.	Stanleyville, Aug. 29, 1909. 6 specimens.
Cat. No. 3257.	Stanleyville, March 1915. 2 specimens. Female is type and male used in drawing figure.
Cat. No. 3244.	Stanleyville, March 1915. 31 specimens.
Cat. No. 3258.	Stanleyville, Aug. 10, 1909. 7 specimens.
Cat. No. 3300.	Stanleyville, Aug. 4, 1909. 1 specimen from the stomach of a toad (*Bufo regularis*).
Cat. No. 3265.	Bengamisa. Sept. 1914. 1 specimen.

Eubelum stipulatum Budde-Lund

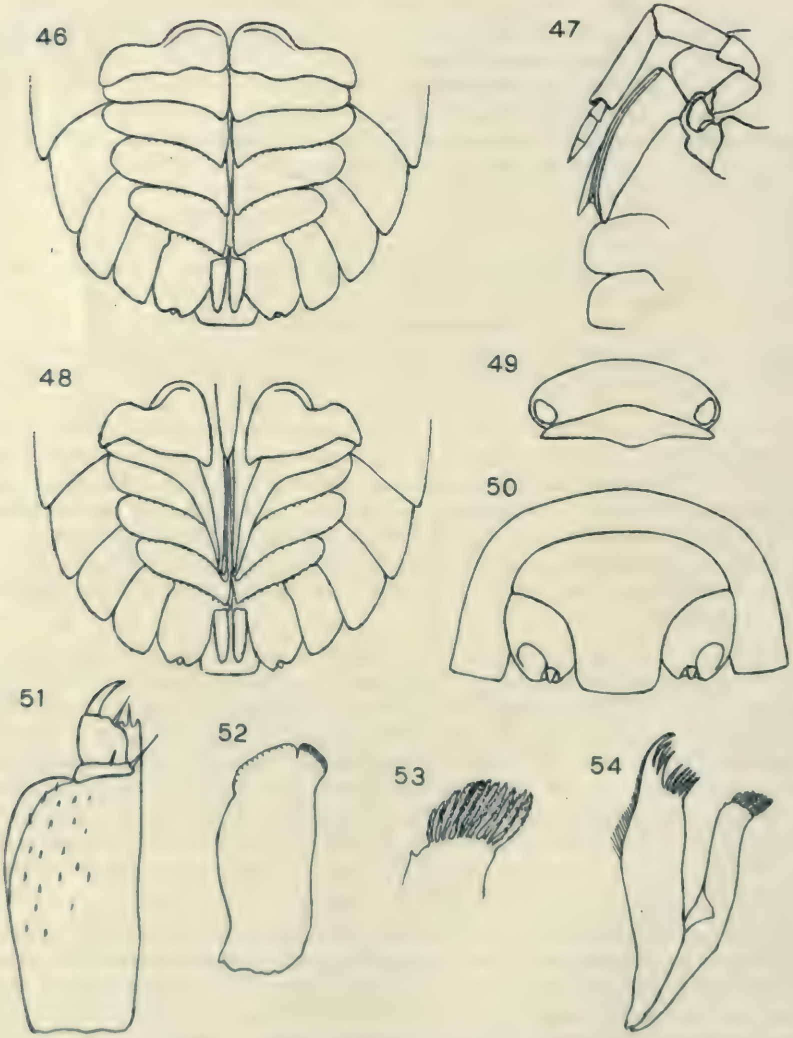
Text Figures 46 to 55

Eubelum stipulatum Budde-Lund, 1899, Revision of Crustacea Isop. Terrestr., (part 1), p. 71, Pl. I, figs. 1–16.

Body convex, contractile into a ball; in a dorsal view not greatly different from *E. stanleyanum*, though the epimera are rather more squarely and evenly cut off at the ends. The body surface is smooth, even, and shining, without granulation but with scattered extremely minute pits visible only on considerable magnification. Color grayish brown above with rather obscure yellowish markings and margins on the segments; basal segments of the uropoda and the under parts and legs yellowish. Length of specimens: female, about 11 mm.; two males, about 9.5 mm. and 10.6 mm., respectively.

Head with its anterior outline evenly convex as seen from above; the superior margin of the epistome forms only a very narrow projecting border but this is continuous across the front. Seen from in front, this border slopes up gradually from the sides to the middle, where it forms a very obtuse and gently rounded off angle. Eyes well developed, with 22 to 25 ocelli. Antennæ of moderate length and stoutness; their fourth segment is less than three-fourths the length of the fifth and the flagellum is distinctly three-segmented, the first article being the shortest, the second slightly the longest. First maxilla with nine teeth (3+5 with a slender accessory tooth beside the second) on the outer division, and a row of about eleven closely crowded plumose processes on the inner division.

Posterior lateral angles of first segment somewhat produced backward, slightly truncate in an oblique direction at the apex, which is cleft to receive the second segment when the body is rolled up. The lateral margin of the first segment when seen from one side is evenly curved, with a wide thick projecting border extending along its length as far as the truncated part of the posterior angle. This border has a moderately wide and deep sulcus along its whole length; the sulcus is situated on its external aspect but is narrowly visible in a ventral view also. The whole projecting border is separated from the main part of the segment by a very deeply impressed groove. The inner side of the cleft posterior lateral angle is a little more produced ventrally (though scarcely more posteriorly) than the outer and, instead of being truncated, is rather sharply rounded off. Processes wanting on the inner surface of the lateral ends of the second and following segments; there is scarcely any thickening of their anterior margin. Legs of moderate length and stoutness, with rather few spines.



Figs. 46 to 54. *Eubelum stipulatum* Budde-Lund, 1899.
46. Pleopoda of female, × 10.5.
47. Antenna and outline of anterior segments, ventral view, × 10.5.
48. Pleopoda of male, × 13.2.
49. Outline of head, front view, × 9.
50. End of abdomen, posterior view, × 16.
51. Inner division of maxilliped, × 34.
52. Second maxilla, × 34.
53. Tip of inner division of first maxilla, × 85.
54. First maxilla, × 34.

The form of the pleopoda is shown in the accompanying figures; in the female the first two pairs are much more swollen and tracheate than the others. The terminal segment of the abdomen is broad and tapering, with concave sides; its end is broadly truncated, with a slightly convex outline and the corners a little rounded off. Uropoda with the exposed external surface very conspicuously convex; their outline is somewhat oval. The small external branch is borne in a notch lying chiefly on the external surface close to the terminal margin, which is a little indented. There is a fairly well-marked, shallow depression on the external surface between this notch and the outer margin. The inner branches do not reach to the end of the terminal segment of the abdomen.

Specimens collected:

Cat. No. 3264.	**Stanleyville, February 1915, one female.**
Cat. No. 3262.	**Bengamisa, September 1914, one male.**
Cat. No. 3302.	Stanleyville, one male, found in the stomach of a toad (*Bufo regularis*) taken Aug. 4, 1909.

55

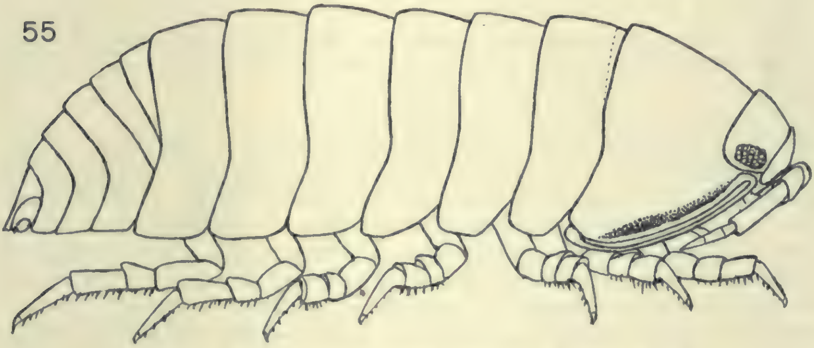


Fig. 55. *Eubelum stipulatum* Budde-Lund, 1899. Female, × 10.5.

Budde-Lund described this species from Bonge in Cameroon. His specimens were somewhat larger, 13 mm. to 15 mm. long, and had, according to his description and figures, more numerous ocelli (twenty-eight to thirty) and more plumose processes (thirteen) on the inner division of the first maxilla than the present examples, but otherwise the correspondence is so close that, in spite of the difference of locality, I am unwilling to describe the Congo Expedition specimens as new, especially as they may not have reached their full growth and size. Possibly they may eventually prove to be distinct, but the information and material now available do not appear sufficient to furnish satisfactory distinguishing characters.

This form is closely allied to *E. instrenuum* Lönnberg and Budde-Lund, 1912, from British East Africa, but in that species the margin of the first thoracic segment is described as scarcely sulcated ("vix sulcato").

Another nearly allied form is *E. lubricum* Budde-Lund, 1885, from Landana and Chinchoxo (Portuguese Congo), but that species is described as having the superior outline of the epistome partly effaced in the middle part of the head. (See also the next species.)

Eubelum propinquum, new species

Text Figures 56 to 62

A rather large male specimen (Cat. No. 3271), 13 mm. long, of a slaty gray color above with rather conspicuous yellowish markings and margins on the segments, appears to differ specifically from the form just described under the name *E. stipulatum*, though exceedingly closely allied to it.

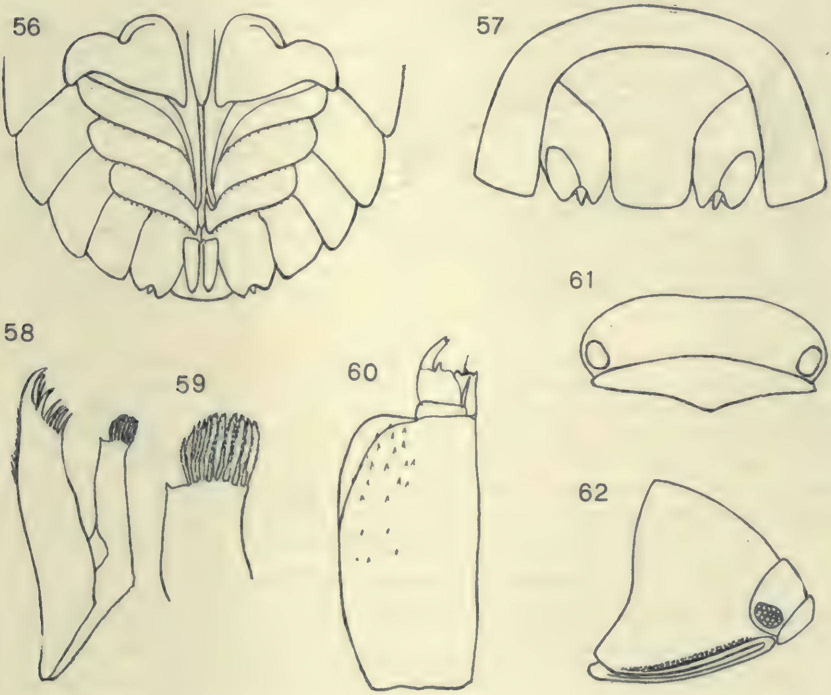
The body is perhaps a little more stout and convex; the surface is exceedingly smooth, considerable magnification disclosing neither granulation nor pubescence, but the surface is dotted with minute pits or punctures abundantly and quite evenly distributed.

The epistome has its upper border complete across the front of the head; it is but little projecting and is rather gently arched; the forehead is rather low; the eyes are large and prominent, with about twenty-five ocelli. The antennæ are missing in the specimen here described. (In a specimen from Medje, Cat. No. 3249, presumably of this same species, they are moderately long and rather slender, their fifth segment rather more than one and one-quarter times the length of the fourth; the flagellum nearly equal to the fourth segment and composed of three articles, the first the shortest of the three, the second not much longer than the terminal one.) The outer division of the first maxilla has nine teeth (3+5 with an additional slender accessory tooth beside the second); the inner division has eleven or more closely crowded plumose processes.

The first segment of the thorax has its posterior outer angles a trifle more produced backward than in the case of *E. stipulatum*, the outer side of the cleft ends in sharper posterior angle and the inner side is a little more produced backward than in that species. In a lateral view the lateral inferior outline of the segment is straighter (less convex downward); the thickened border is marked off from the main part of the segment by a narrower groove and is itself more conspicuously narrowed toward the rear; but these differences are slight and only noticeable on careful comparison. The legs are also more spiny than in that species; on the inferior aspect of the anterior pairs of legs the spines are so thickly distributed as to suggest a brush with short thick bristles.

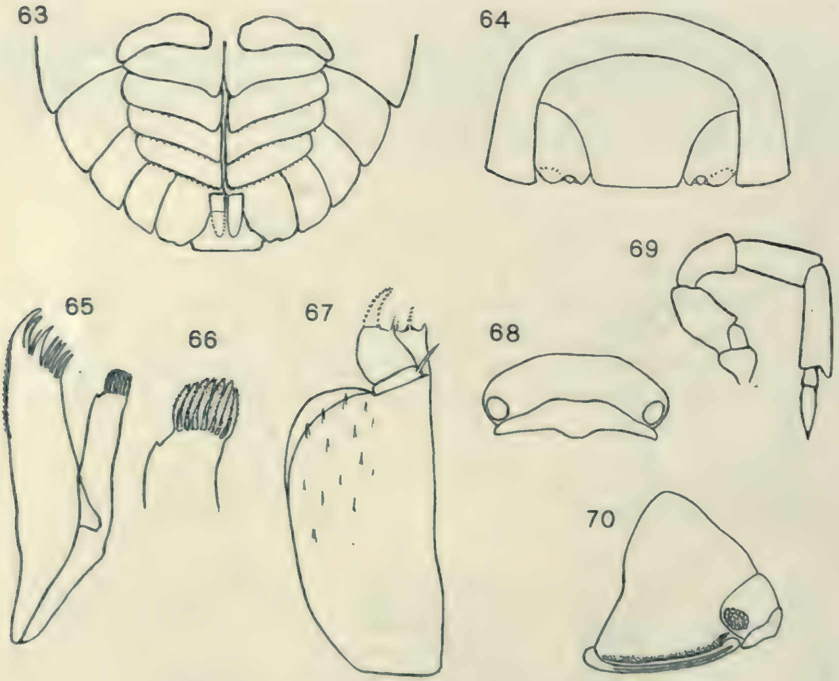
The abdomen and its appendages are also very similar to those of *E. stipulatum*. In the present form, however, the last segment of the abdomen is longer and narrower, with the sides of the central extension parallel instead of converging toward the end. The first pair of pleopoda are proportionately longer. The basal segments of the uropoda are more elongate and the rudimentary external branches also more elongate and proportionately longer and more conspicuous, and the oval depression on the external surface of the basal segment is larger and more elongate.

The above specimen is labeled "Thysville, June 2, 1915, from a mushroom-shaped termite structure." The hard integument and bright colors of this species show that it cannot be an inhabitant of the interior of termites' nests and, if the label is correct, it was probably merely taking refuge in some external crevice of the nest.



Figs. 56 to 62. ***Eubelum propinquum*, new species.**
56. Pleopoda of male, × 9.
57. End of abdomen, posterior view, × 13.
58. First maxilla, × 26.
59. Tip of inner division of same, × 65.
60. Inner division of maxilliped, × 26.
61. Outline of head, front view, × 10.
62. Side view of head and first segment of body, × 7.8.

Another specimen, alluded to above, (Cat. No. 3249), also a male but slightly smaller than the one described, labeled Medje, July 1914, is probably of this same species, but is in a rather poor state of preservation.



Figs. 63 to 70. ***Eubelum asperius***, **new species.**
63. Pleopoda of female, × 12.
64. End of abdomen, posterior view, × 16.
65. First maxilla, × 46.
66. Tip of inner division of same, × 90.
67. Inner division of maxilliped, × 42.
68. Outline of head, front view, × 9.6.
69. Antenna, × 16.
70. Side view of head and first segment of body, × 8.5.

Eubelum asperius, new species

Text Figures 63 to 70

The only specimen obtained is a female, 8.5 mm. long, with an empty brood-pouch. This species also very closely resembles *E. stipulatum*, described above, and the description there given will apply to this form also with the following modifications.

Body surface rougher, with small irregularly distributed roughened pits, easily visible with low magnification, closely distributed over the surface; they are slightly setose, giving the body surface a somewhat pubescent character. Ground color of upper parts rather light brown, lower parts and legs pale yellowish brown. There are the usual light markings and borders on the segments; the markings on the lateral parts of the back form more regular rows of short bars than they do in *E. stipulatum*.

Head narrower and a little more convex in front outline in a dorsal view. Seen from in front, the anterior or upper margin of the epistome is highest at a point a little each side of the median line, where it dips down a little and is less well marked. Eyes proportionately a little larger, with about twenty ocelli. Antennæ apparently a little longer; their flagellum has but two articles,[1] the first being very short. First maxilla with nine teeth (3+5 besides a slender accessory tooth beside tooth 2 on the outer division) and about nine plumose processes on the inner division.

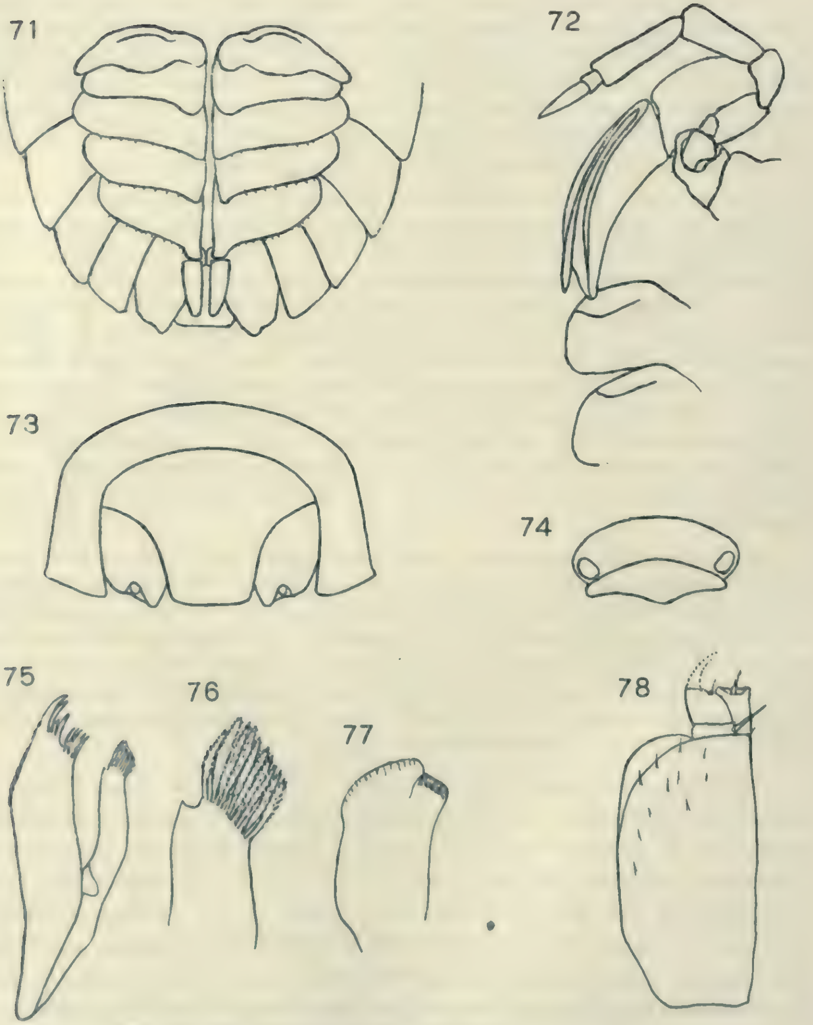
The characters of the first segment of the thorax are closely similar to those of *E. stipulatum*, except that the posterior angle is scarcely truncated but merely a little blunted at the apex. The impressed groove marking off the projecting border from the body of the segment turns up sharply and conspicuously just behind its anterior end near the eye. The sulcus on the external-ventral aspect of the border is less sharply defined. The notch for receiving the second segment when the body is rolled up is small but with rather widely divergent sides; its inner side is produced considerably farther back then the outer and is sharply rounded off. The second and third thoracic segments have the inner side of the anterior margin of the lateral parts quite conspicuously thickened but they bear no processes. These two segments are a little more rounded at the ends than in *E. stipulatum*. The spines on the legs are much worn and broken in this specimen; they appear to have been only moderately numerous.

Last segment of abdomen wide, its median extension short, with the sides curved and converging toward the wide, squarely truncated end. The exposed parts of the basal segments of the uropoda are somewhat triangular, with the external surface moderately convex without any large depression. The notch for the small short rudiment of the external branch is on the posterior margin well removed from the inner angle, and lies chiefly on the external aspect; seen from the inner or anterior side the margin is only a little indented by this notch. The inner branches of the uropoda do not reach to the end of the abdomen.

The only specimen (Cat. No. 3256) is from Zambi, June 1915. Of the species described by Budde-Lund (1899), it appears most closely related to *E. ignavum* from Abyssinia. One of the most conspicuous differences between the two forms is in the inner lamella of the cleft rear angle of the first body segment, which in the present species is considerably extended backward beyond the outer, but is described in the Abyssinian form as scarcely longer than the outer. The last segment of the abdomen and the uropoda are also longer and less wide in *E. ignavum*. *E. instrenuum* Lönnberg and Budde-Lund, 1912, from British East Africa appears to resemble this species in many characters but has the flagellum of the antennæ composed of three articles.

---

[1] Though in some groups the number of articles in the flagellum is a reliable character for generic or subgeneric distinction, in *Eubelum* and probably also in some other sections of the Oniscidæ the character seems to be of less importance, a two-segmented flagellum having apparently developed independently in species not closely related by a coalescence of the two terminal articles.



Figs. 71 to 78. ***Eubelum garambæ*, new species.**
71. Pleopoda of female, × 18.
72. Antenna and outline of anterior segments, ventral view, × 22.
73. End of abdomen, posterior view, × 25.
74. Outline of head, front view, × 10.
75. First maxilla, × 44.
76. Tip of inner division of same, × 130.
77. Terminal part of second maxilla, × 44.
78. Inner division of maxilliped, × 44.

Eubelum garambæ, new species

Text Figures 71 to 79

This species is represented by but one specimen, a female only about 7 mm. long, with marsupial plates developed. It is closely related to *E. stipulatum* and even more closely to *E. asperius*, but the body, though very convex, is a little narrower than in either of those species.

Surface even but with minute, not very closely distributed punctæ and with considerable pubescence. The thoracic segments have a considerable degree of individual convexity in an antero-posterior direction; the part overlapped by the preceding segment is marked off by a rather conspicuous depressed line or furrow. Color grayish brown above, with obscure yellowish markings and margins on the segments; under parts yellow.

79

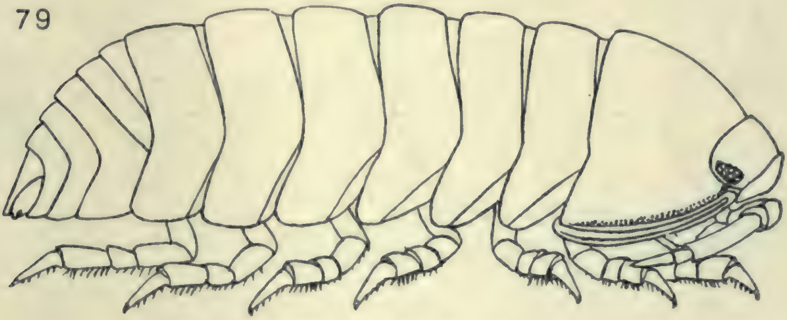
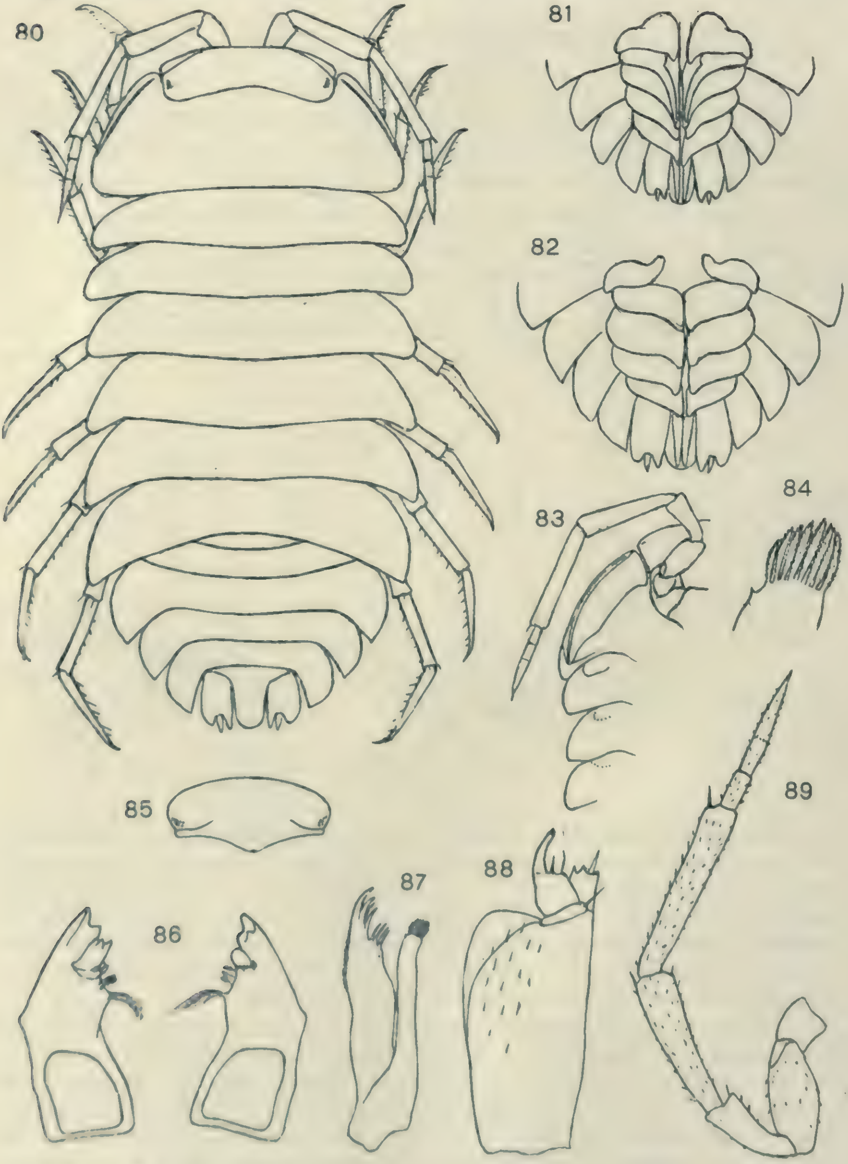


Fig. 79. *Eubelum garambæ*, new species. Female, × 15.

Head narrow, superior line of epistome considerably arched and only very slightly prominent, but continuous across the front of the head. Eyes rather large but with comparatively few ocelli (about fifteen well-formed ones). Antennæ of moderate length and stoutness, very pubescent. No third article was demonstrated in the flagellum, which is, however, fairly long and slender. First maxilla with eight teeth (3+5), in addition to a very small accessory tooth beside tooth 2 on the outer division, and about ten plumose processes on the inner division.

Posterior lateral corners of first thoracic segment produced into an angle, which is not truncated or rounded off and is provided with a small cleft for the reception of the second segment when the body is rolled up. Sides of this cleft only moderately divergent, the inner side is rounded off and a little more extended than the outer. There is a prominent and thick, but not very wide, projecting lateral border on the first thoracic segment marked off from the body of the segment by a well-defined furrow. The border and furrow extend almost to the posterior angle of the segment but the border becomes narrow and inconspicuous before the angle is reached. There is a wide and fairly deep sulcus the whole length of the border on its external ventral aspect, the sulcus widens noticeably in the posterior third of its length. The lateral parts of the second and third thoracic segments have the anterior border



Figs. 80 to 89. *Eubelum tenebrarum*, new species.
80. Female, × 11.
81. Pleopoda of male, × 11.
82. Pleopoda of female, × 11.
83. Antenna and outline of anterior segments, ventral view, × 11.
84. Tip of inner division of first maxilla, × 115.
85. Outline of head, front view, × 11.
86. Mandibles, anterior aspect, × 32.
87. First maxilla, × 32.
88. Inner division of maxilliped, × 34.
89. Antenna, × 24.

thickened on the inner surface but bear no processes. Their ends are rather narrowly and sharply rounded and the ends of the remaining thoracic segments are less abruptly truncated than in *E. stipulatum.* The legs are of moderate length and rather slender; their spines are not very numerous but fairly stout. The abdomen is rather narrowly rounded behind, the ends of the segments bend or flare outward a little. The last segment is as in *E. asperius* but narrower and longer, and less broadly truncate at the end. The basal segments of the uropoda have the exposed parts somewhat triangular; their terminal border is quite oblique, the inner angle being much more produced than the outer and exceeding a little the tip of the abdomen. The notch for the short rounded rudiment of the external branch lies in the posterior border but mostly on the external aspect. Seen from the anterior or inner side, the posterior border is scarcely indented. The external surface of the basal segment of the uropoda is only moderately convex and has no large depression. The inner branches of the uropoda are rather stout; they do not reach to the end of the abdomen.

The only specimen (Cat. No. 3260) is from the extreme northeastern part of the Congo region, Garamba, collected in March 1912.

90

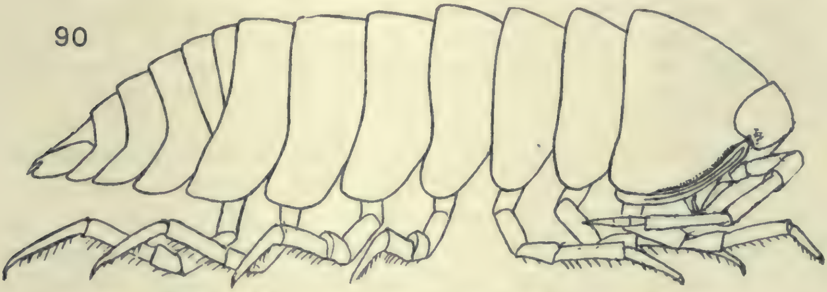


Fig. 90. *Eubelum tenebrarum*, new species. Female, × 11.

Eubelum tenebrarum, new species

Text Figures 80 to 90

Body moderately wide and of oblong outline when seen from above; rather soft and quite loosely articulated; the lateral ends of the segments slightly extended. The back is not very convex; its surface is smooth but not shiny; punctate under magnification, but not pubescent. Color in alcohol dull yellowish white (white in life according to notes taken by the collector). Size of a large female, 8.7 mm. long by 4.3 mm. wide; the males are smaller, a large one measuring 6.8 mm. long by 3.4 mm. wide.

Head small; its anterior outline nearly straight in the middle, though receding toward the corners. The superior margin of the epistome forms a projecting border only near the sides; in the middle part the line of demarkation disappears. Mouthparts forming a prominently projecting mass. First maxilla with eight teeth (3+4 with an additional accessory tooth beside the second) on the outer division; the inner division bears a row of about eight plumose processes. Antennæ very long and slender; the flagellum long, of two distinct articles of which the last is about two and one-half times the length of the first. In some individuals a very obscure segmentation of the second article into two was demonstrated; in others I could not detect it. Eyes very small and imperfect, with indistinct ocelli and very little pigment.

First segment of thorax with a moderately thick, but rather narrow, projecting border separated from the main part of the segment by a narrow deeply impressed groove. The border, which extends about four-fifths of the length of the margin, has a fairly well-marked sulcus along its external aspect. This sulcus is slightly obliquely situated so that it is somewhat visible from a ventral direction also, especially toward the posterior end. The posterior lateral angle of the segment is rounded off in a small curve and has a small cleft to receive the second segment; the outer side of the cleft extends a little farther back but not so far ventrally as the inner. The front margin of the epimera of the second, third, and fourth segments is thickened on the inner side but none of them bear any process. The thoracic segments are somewhat rounded at the ends, especially in the anterior part of the body. The legs are rather long, quite slender, and rather weak.

The epimera of the third, fourth, and fifth abdominal segments end in rather sharp, backwardly directed angles. The last segment has a wide but very short base, the median extension has nearly parallel sides and a very rounded extremity. The basal segments of the uropoda are deeply notched on the posterior margin; these notches are occupied by the outer branches which, though small, are elongate and sharp pointed; they are visible both in a dorsal and ventral view of the body. The inner branches are long and tapering; they lie beneath the median part of the last segment, extending to its end.

About sixty specimens (Cat. Nos. 3242 and 3266) of this species were collected at Thysville, June 2, 1915, "from the shelves of a cave" which is described in Bull. Amer. Mus. Nat. Hist., XXXVII, p. 541. A few of the females have a brood-pouch developed, containing a few large eggs. The rather soft, loosely articulated body, the lack of pigmentation and the almost functionless eyes are modifications that would be expected in a form inhabiting such a cave as that in which this species lives. These modifications are, however, of a very superficial kind, and in the form and structure of its parts there seems to be no sufficient reason for placing it elsewhere than in the typical subgenus of *Eubelum*.

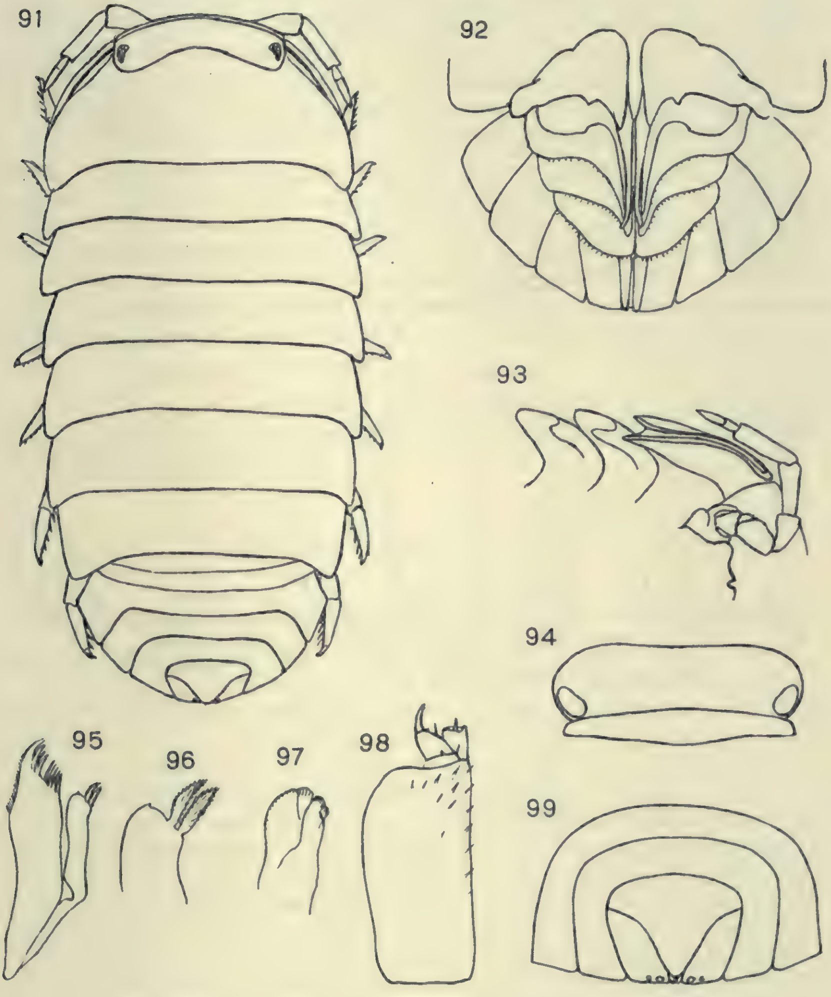
Oniscinæ (=Oniscidæ *auct. mult.*)

Synarmadillo globus Budde-Lund

Text Figures 91 to 100

Synarmadillo globus Budde-Lund, 1909, in Voeltzkow, Reise in Ostafrika, II, p. 276, Pl. xiii, figs. 37–44.

Body broad in proportion to its length; back very convex; front outline of head strongly and evenly convex; rear end of body rather broadly rounded. Articulation very compact and smooth; body surface unusually smooth, showing under considerable magnification only very minute and even granulation and numerous depressed



Figs. 91 to 99. *Synarmadillo globus* Budde-Lund, 1908.
91. Male, × 6.
92. Pleopoda of male, × 7.2.
93. Antenna and outline of anterior segments, ventral view, × 6.
94. Outline of head, front view, × 9.
95. First maxilla, × 20.
96. Tip of inner division of same, × 50.
97. Terminal part of second maxilla, × 20.
98. Inner division of maxilliped, × 20.
99. End of abdomen, posterior view, × 7.2.

dots or punctæ. Color dark slaty gray above, the segments marked and bordered with pale yellow, the under parts and legs also pale yellow. This is the largest and most conspicuously marked terrestrial isopod collected by the Expedition; the single specimen obtained, though a male and hence doubtless considerably inferior to adult females in size, would measure nearly, if not quite, 15 mm. long if straightened out, and its stoutness and highly convex back give it unusual bulk for its length.

Head rather small, the superior border of the epistome forming only a very narrow projecting border, but this extends completely across the front of the head. Eyes proportionately small, with about twenty-two ocelli; antennæ rather short and small, the fourth and fifth segments nearly equal in length, the flagellum with only two articles, the basal about half as long as the terminal one. The mandibles are more elongate and less crooked than in the next species (*Synarmadillo lubilensis*). The first maxilla has nine teeth (4+5, two of these representing enlarged accessory teeth beside the main row) on the outer division, and two plumose processes and a very minute spine on the inner division. Seen from one side, the lateral margin of the first thoracic segment is curved, especially in the posterior part; its posterior angle is cleft to receive the second segment when the body rolls up. The outer side of this cleft is less produced downward and backward than the inner; the latter forms a rather sharp angle. The whole length of the margin, almost to the extreme rear angle, is turned outward to form a thick but narrow projecting border of even width. This border turns sharply out from the main part of the segment, thus forming a fairly distinct line of demarkation but there is no impressed groove along that line. The border has a sulcus along its whole length; the sulcus lies on the external inferior aspect and is rather narrow, widening, however, somewhat rapidly a little way before the cleft at the rear angle is reached.

100

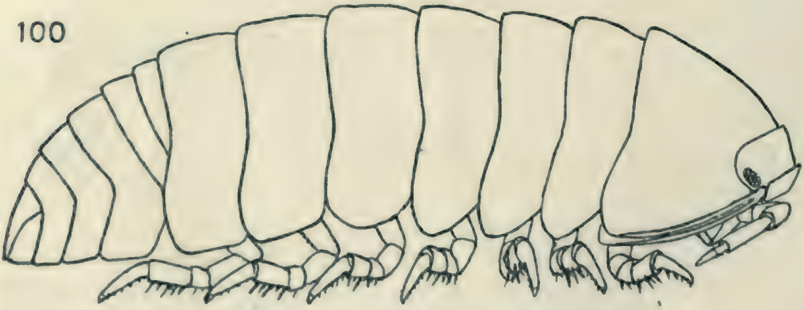


Fig. 100. *Synarmadillo globus* Budde-Lund, 1908. Male, × 7.

Second segment of thorax with a short process on the inside of the lateral part; third segment with a slight rudiment of a process. The second to fourth thoracic segments inclusive have the ends somewhat angular, though a little rounded off, and not produced beyond the general outline of the body; the fifth has the ends broadly rounded; the sixth and seventh are rather squarely cut off. Legs rather long; they have few but stout spines.

This species differs from all related forms collected by the Expedition in having the last segment of the abdomen taper to a slightly rounded triangular point, which, however, is not quite long enough to equal the truncated ends of the basal segments of the uropoda that fill in the outline of the body on either side of it. The external branches of the uropoda are represented by an exceedingly minute rounded rudiment borne on the external aspect of the basal segment close to, but a little above, the terminal margin (which is not indented) and near the inner corner. Just external to the rudimentary external branch there is a minute pore or pit filled with a yellow substance. The internal branches are long and slender and reach a trifle beyond the triangular tip of the last abdominal segment.

The only specimen (Cat. No. 3243) was collected at Zambi in June 1915. It corresponds well with Budde-Lund's description and figures. His specimens were from Cameroon (Bibundi and Bonge), collected by Dr. Y. Sjöstedt in November 1891.

Synarmadillo lubilensis, new species

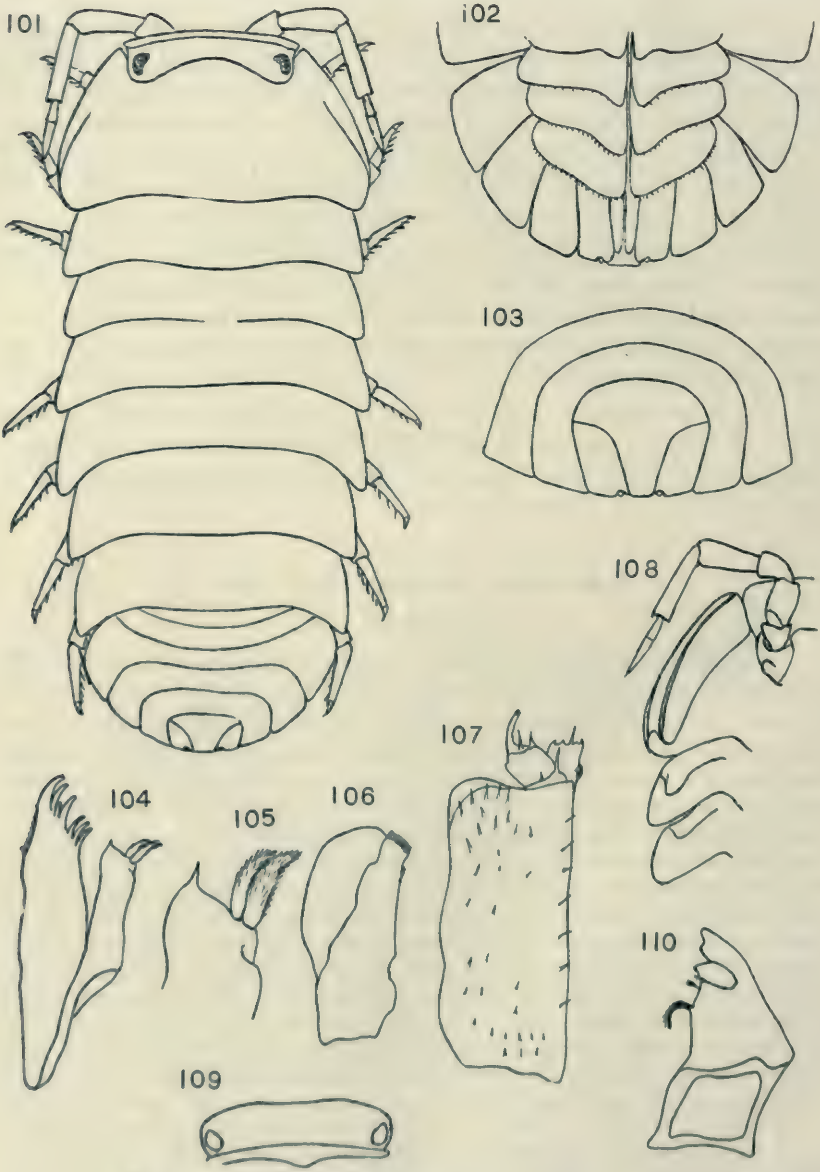
Text Figures 101 to 110

The single specimen collected is a female, 13 mm. long, apparently fully adult, but without a brood-pouch.

Body oblong in a dorsal view, contractile into a ball; the head wide, with its front outline only slightly convex; the abdomen broadly rounded behind. Articulation not very compact; back moderately convex, its surface slightly and very finely granular under magnification. Color dark brown above with obscure yellowish markings and margins on the segments; under parts yellowish.

The anterior margin of the epistome forms a moderately prominent projecting border extending across the front of the head. Eyes rather small, with about twenty ocelli. Antennæ of moderate length, the fifth segment considerably longer than the fourth, not very stout; the flagellum is rather long and slender with two well-defined articles; its basal article is over one-third the length of the entire flagellum; the second article is very obscurely segmented into two parts, the terminal part a little longer than the proximal. The first maxilla has six teeth (3+3, with an additional small accessory tooth beside No. 2) on the outer division, and two plumose processes and a conspicuous spine on the inner division. The mandibles are short and crooked; they have (on the right mandible at least) but one small tuft ("penicillus" in the terminology of Budde-Lund, 1909, p. 54) distal to the large brush-like appendage.

First segment of thorax with its posterior lateral angles slightly produced backward and rounded off; there is a very small cleft to receive the second thoracic segment when the body is rolled up; the inner side of the cleft is considerably less produced than the outer. Seen from one side, the lateral margin of the first thoracic segment is nearly straight: its border is thin, widely projecting and, especially in the anterior part, considerably turned or rolled upward; there is no groove separating the



Figs. 101 to 110. *Synarmadillo lubilensis*, new species.
101. Female, × 7.2.
102. Pleopoda of female, × 9.6.
103. End of abdomen, posterior view, × 9.6.
104. First maxilla, × 27.
105. Tip of inner division of same, × 66.
106. Second maxilla, × 27.
108. Antenna and outline of anterior segments, ventral view, × 7.8.
109. Outline of head, front view, × 7.8.
110. Right mandible, anterior aspect, × 27.

border from the body of the segment. On the inferior aspect of the edge of the segment (scarcely visible in a lateral view) there is a broad shallow sulcus (rather deeply and sharply impressed along its inner margin and poorly defined along its outer margin) that extends along the whole length of the border of the segment and is continuous behind with the above-mentioned cleft for the reception of the second segment. Lateral ends of the second to fourth thoracic segments somewhat rounded off at the corners; those of the succeeding segments are more squarely cut off. Second segment with a thickening or infolding of the anterior margin of the epimeral part of the segment. This thickened part is produced at the end into a very slightly projecting rudiment of a process. The third segment has the margin a little thickened but not at all produced. The legs are moderately long and rather slender, their spines rather few and weak.

111

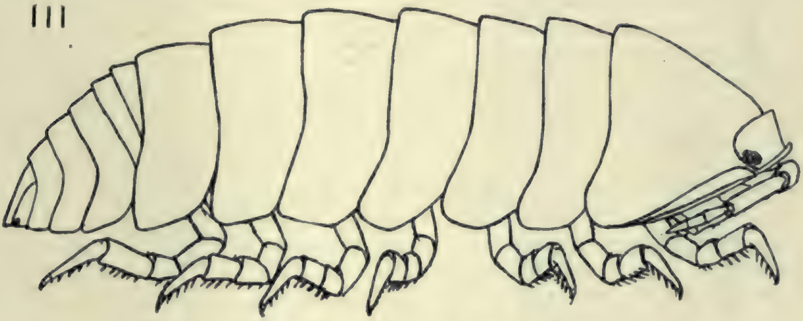


Fig. 111. *Synarmadillo lubilensis*, new species. Female, × 8.

Last segment of abdomen T-shaped; its median part is narrow and rather elongate, with straight sides which converge toward the narrow truncated end. The exposed parts of the basal segments of the uropoda are obliquely quadrangular and rather narrow and elongate, with straight sides which converge toward the truncated end. They have a minute notch directly on the posterior margin, close to its inner corner for the very small and short rudiment of the outer branch.

The inner branches are long and narrow and slightly tapered, they reach almost to the end of the terminal segment of the abdomen.

The only specimen (Cat. No. 3259) was found in a termite's nest at the Lubila River, September 20, 1909.

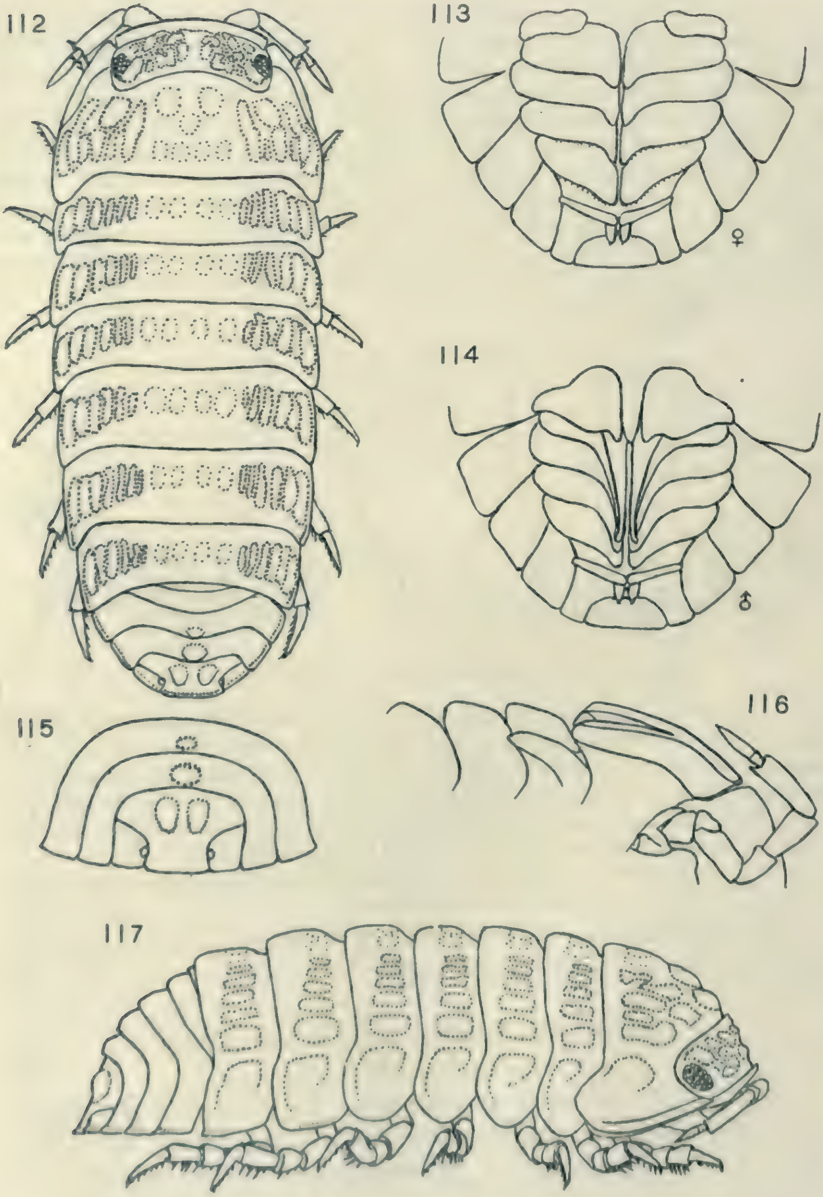
Cubaris[1] (**Diploexochus**) **bananæ**, new species

Text Figures 112 to 117

This and the following species belong, according to Budde-Lund's (1909) classification, in the subgenus *Diploexochus*. While agreeing to this subdivision of *Cubaris* as a natural one, the question may be raised

---

[1] *Armadillo* Latreille, 1804, commonly used as the generic name of this group is, as pointed out by Stebbing (1902, p. 650), antedated by *Armadillo* Brisson, 1762, syn. of *Dasypus*, a genus of mammals, and is therefore absolutely excluded. *Cubaris* Brandt, 1833, seems to be the next available name and is here used in a comprehensive sense for the entire genus. If used as a subgeneric name, *Cubaris* must, therefore, be employed for the typical Old World section of the genus.



Figs. 112 to 117. *Cubaris bananæ*, new species.
112. Female, × 16.
113. Pleopoda of female, × 27.
114. Pleopoda of male, × 27.
115. End of abdomen, posterior view, × 27.
116. Antenna and outline of anterior segments, ventral view, × 18.5.
117. Female, × 16.

as to whether Budde-Lund was correct in using the name *Diploexochus* for it, since that was originally applied by Brandt (1833, p. 192) to an American species (*C. echinatus*) which may prove to be subgenerically distinct from the African forms.

Body rather compactly articulated, ovate oblong as seen from above, widest at the posterior end of the first segment of the thorax. The anterior end of the body is broadly rounded, the posterior end has the outline of a rather narrow ellipse. Back highly arched. Surface, when seen under considerable magnification, very slightly granular and with a trace of pubescence. In addition to this minute granulation the dorsal surface is raised into low elevations, though these are slight and poorly defined. Along the middle part of the back these are mostly of rounded form and are very low and inconspicuous; a group of three on the fore part of the first segment, single median ones on the fourth and fifth abdominal segments, and a pair on the last abdominal segment being the most prominent. Along the sides of the thorax they are of oblong form and are more prominent. There are about six of these on each side of each segment. The lateral ends of the posterior thoracic and of the abdominal segments turn or flare slightly outward at the extreme edge. Color in the best preserved examples gray or grayish brown; the segments with a narrow yellowish or pale border and yellowish markings, which in many cases correspond more or less closely in situation and extent with the above described elevations of the surface. The specimens are all of small size; the largest, could it be straightened out, would hardly measure over 5.3 mm. long by 2.1 mm. wide. They may not have reached their full size but do not have the appearance of being young. Except the usual differences in the pleopoda (see Figs. 113, 114), no sexual differences were made out.

Head proportionately large; its front outline gently arched with a well-developed projecting border. Antennæ short but moderately stout. Their flagella consist of two quite closely joined articles of which the first is very short. Eyes large, with about fifteen ocelli.

Lateral margin of first thoracic segment turned outward to form a fairly wide projecting border, but this is not separated from the body of the segment by any distinctly defined groove. The lateral edge is not thickened; on its ventral aspect there is a well-marked sulcus on the posterior half; this narrows gradually and closes completely just in front of the middle of the segment. There is a small cleft (to receive the anterior margin of the second segment when the body is rolled up) at the posterior lateral angle of the first thoracic segment, which is conspicuously prolonged backward and broadly truncated with the corners a little rounded off. The inner side of the cleft extends backward fully as far as the outer side. The second to fourth segments inclusive are rather short; their lateral ends are not much extended backward and are rather narrowly rounded off; only the second bears a process on the inner aspect of the lateral part. This process is, however, quite long, though narrow, and is directed obliquely posteriorly and ventrally. The last three thoracic segments are longer than the three preceding ones; the lateral ends of the last two are somewhat squarely truncated. The legs are fairly large and stout and bear few spines.

The first segment of the abdomen is nearly (in some positions of the body entirely) concealed. The last segment is about two-thirds as long as it is wide and is considerably contracted in the middle part; its truncated end is a little more than half the width of the upper part of the segment. The inner branches of the uropoda (visible only from below) are short and thick and extend but a little way down the inner aspect of the terminal abdominal segment; the outer branches are represented by very minute oval rudiments on the inner margin of the outer aspect of the broad basal segments of the uropoda, close to the constricted part of the last abdominal segment.

Specimens collected:

Cat. No. 3270. (Type) Banana, July-August 1915.
Cat. No. 3268. (Paratypes) Banana, July-August 1916, 9 specimens.
Cat. No. 3269. Zambi, June 1915. One male.

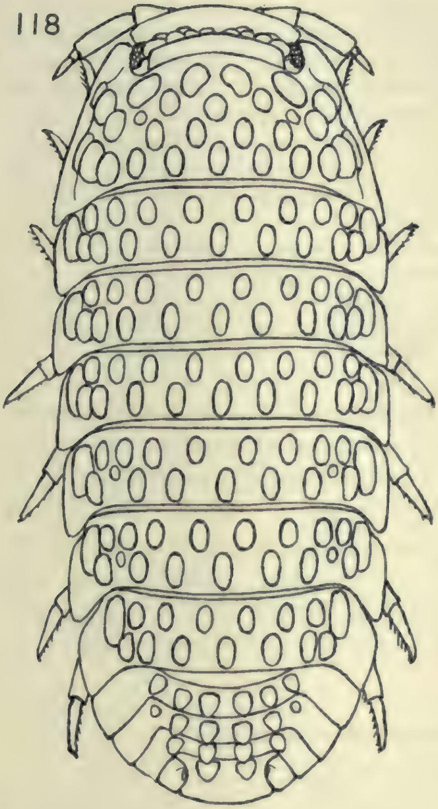
From two small species of this group which would seem from the descriptions to be of somewhat similar appearance, *C. bituberculatus* and *C. nanus*, described by Budde-Lund (1910) from the region of Mt. Kilimanjaro, East Africa, this form is distinguished by many minor characters—from the former, among other differences, by not having the sulcus on the inferior margin of the first segment extending the whole length; from the latter by the outline of the rear margin of the first segment, which in that species is described as "subrectus, utrinque ad angulos laterales levissime incurvus." In the present species the rear margin makes a considerable angle above the conspicuously produced lateral corners. *C. liliputanus* (Dollfus), 1895, from Pretoria, Transvaal, is another allied form, but it has a longer sulcus on the first segment, the outer branches of the uropoda less rudimentary, and the terminal abdominal segment more constricted.

Cubaris (**Diploexochus**) **regulus**, new species

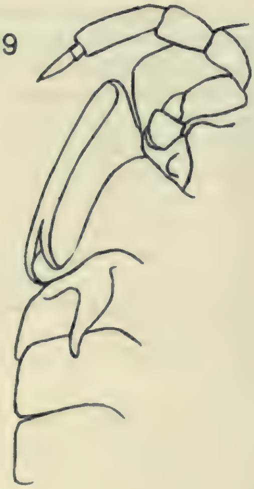
Text Figures 118 to 121

In spite of its very different appearance, due to the great development of the ornamentation of the dorsal surface, this species differs little from that last described in general form and in the details of its appendages. The largest specimen (both of the two good specimens available are females) slightly exceeds in size any of those of *C. bananæ*, although if it could be fully straightened out it would hardly measure over 6 mm. long. Such differences in the general form of the body as exist are due chiefly to the lateral ends of the segments being more squarely cut off and turning or flaring outward in a horizontal direction very much more than in *C. bananæ*. Antennæ short and small, their flagellum with two articles. Eyes with about fourteen ocelli. The outline of each side of the first thoracic segment is nearly straight when seen in a dorsal view. The sulcus on the ventral aspect of the lateral border of this segment is scarcely at all developed. There is only a small cleft to receive the second segment when the body is rolled up; the outer side of this cleft is extended backward considerably more than the inner and it is rather widely truncated in an oblique direction. Second thoracic segment with a backwardly directed, tapering process on the inner side of the lateral part; the third segment has no process. The legs have some of their segments, especially the carpus, somewhat swollen or expanded dorsally. Color in alcohol grayish above, with the summits of the tubercles and borders of the segments, as well as the legs and under parts, light yellowish.

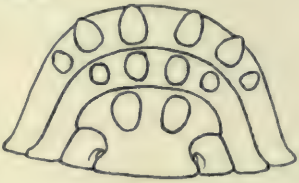
118



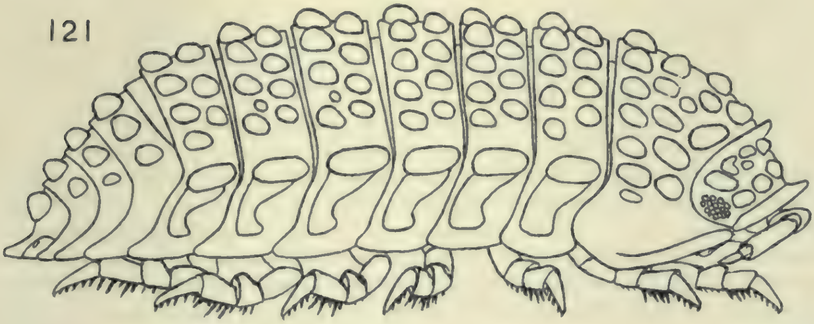
119



120



121



Figs. 118 to 121. *Cubaris regulus*, new species.
118. Female, × 17.5.
119. Antenna and outline of anterior segments, × 24.
120. End of abdomen, posterior view, × 24.
121. Female, × 17.5.

Dorsal surface ornamented with large, highly elevated tubercles regularly arranged. They are mostly of more or less conical form with an oval base and rounded summit. In addition there is a transverse ridge at the posterior margin of the head, and near the lateral ends of the second to seventh thoracic segments there is on each side a large oblong ridge from which a curved elevation, less raised, extends down on the epimeron. The above tubercles are in addition to a conspicuous granulation of the surface; these minute granules are slightly setose. The tubercles are distributed on the head chiefly in two transverse rows; on the first thoracic segment in four rows; on the remaining thoracic segments in two rows, the posterior row having an odd number (seven or nine) and hence a median tubercle, the anterior row eight, none being median. The abdominal segments bear tubercles in one transverse row as follows: the first two, none; the second and third, six each; the fourth, four; the last segment, two. The pleopoda and uropoda differ scarcely at all from those of the last described species, though the rudiment of the external branch of the uropoda is larger.

Two females, Cat. No. 3251 (the larger one the type) were collected at Stanleyville in March 1915, with specimens of *Eubelum propinquum*. Another specimen (Cat. No. 3301), in poor condition, was found in the stomach of a toad (*Bufo regularis*) collected at Avakubi, Oct. 2, 1909.

This form is related to *C. formicarum* (Budde-Lund), 1909, p. 57, Pl. v, figs. 44–56, from South Africa, but the figures show, among other differences, that the terminal segment of the abdomen and the uropoda are much more elongated in Budde-Lund's species than in the present one.

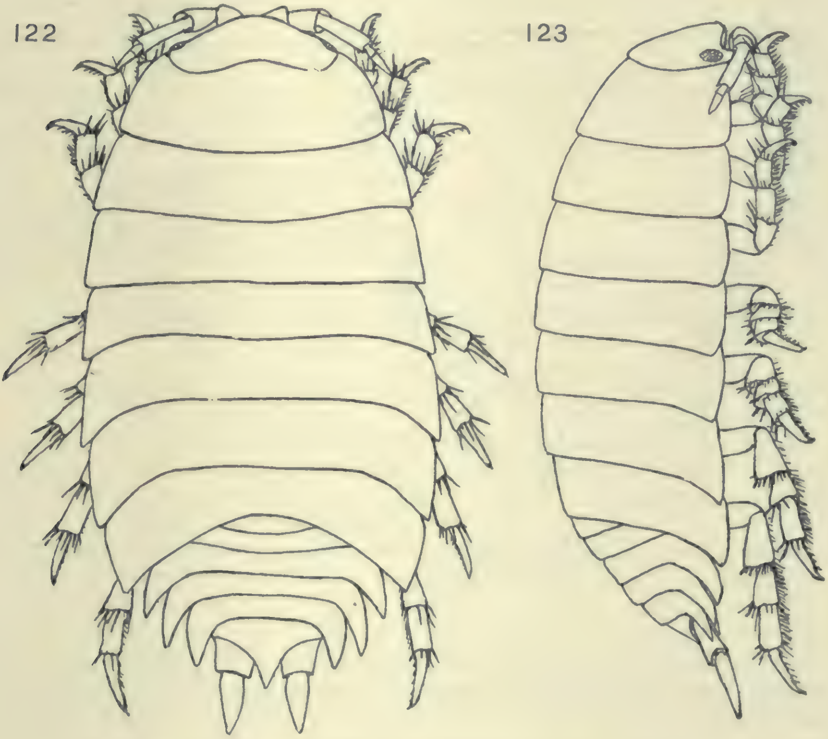
Niambia squamata (Budde-Lund)

Text Figures 122 to 126

Porcellio (Leptotrichus) squamatus Budde-Lund, 1885, Crust. Isop. Terrestr., p. 196.
? Leptotrichus squamatus Dollfus, 1898, Bull. Soc. Zool. France, XXIII, p. 125.
Niambia squamata Budde-Lund, 1904, Revision Crust. Isop. Terrestr., p. 37; 1908, in Voeltzkow, Reise in Ostafrika, II, p. 280, 295; 1909, in Schultze, Ergebn. Forschungsr. Südafrika, II, p. 60, Pl. vi, figs. 1–3. Stebbing, 1910, Ann. South African Mus., VI, p. 441.

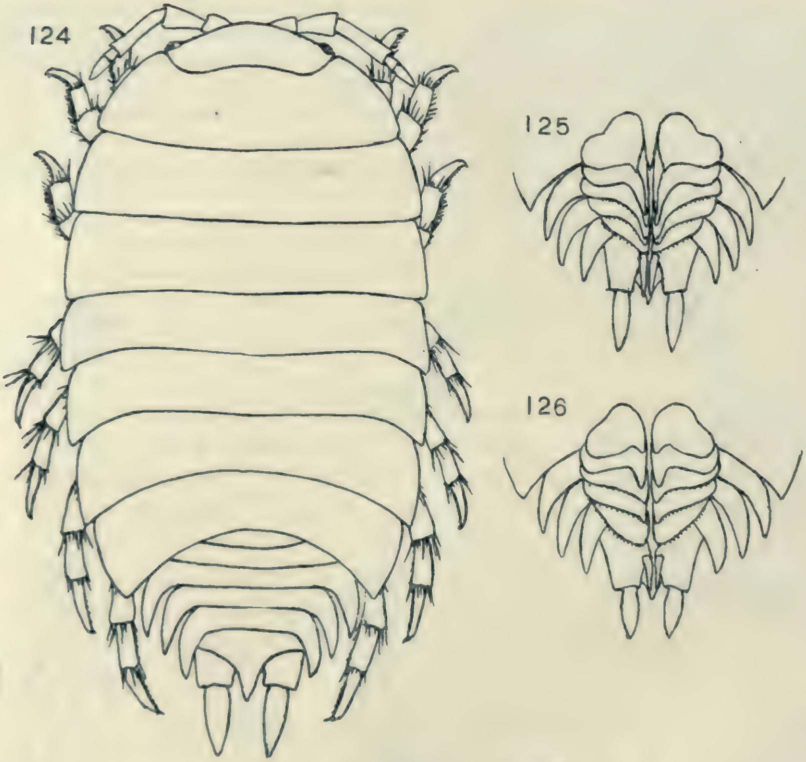
Body as seen from above very wide; the general outline broadly rounded in front and behind; it is fairly compactly articulated; both the head and abdomen are short and moderately set into the thorax. The back is quite convex; the surface smooth and even, but thickly covered with small evenly distributed setose granules. Color slaty gray above, with inconspicuous yellowish markings on the lateral areas of the thorax; legs and lower parts yellowish. The animal does not appear to be able to roll up into a ball. In the single female specimen the body broadens posterior to the middle, reaching its greatest width about the end of the fifth segment; in the two male specimens the outline seen from above is more oblong, with sides more nearly parallel. The female also has the back more strongly convex. Size of female (not fully adult), 5.6 mm. long by 3 mm. wide; largest male, 7.2 mm. long by 4.1 mm. wide.

Head small; as seen from above its posterior border is sinuous, while its anterior outline appears simply convex; two small but very prominent lobes are, however, present at the anterior lateral corners but extend so directly downward (ventrally) that they are barely if at all visible in a dorsal view. The superior border of the epistome is marked by an impressed line. The eyes are small, with few ocelli, and are situated just above the small lateral lobes; they are likewise but slightly visible in a dorsal view. Antennæ short but fairly stout; their flagella have two articles, of which the last is about twice as long as the first.



Figs. 122 and 123. *Niambia squamata* (Budde-Lund), 1885. Female, × 15.

The first thoracic segment is considerably the longest; the fourth and seventh are noticeably shorter than the others. Their lateral ends are cut off almost squarely, but the corners of the first two are rounded off and the posterior corners of the last four or five are produced a little backward, the posterior ones to the greatest extent. Legs moderately long and stout (the anterior ones shorter), with sharp, moderately long claws and numerous rather short, stout spines at the joints and on the ventral side, especially on the merus and carpus of each limb.



Figs. 124 to 126. ***Niambia squamata*** **(Budde-Lund), 1885.**
129. Male, × 12.
125. Pleopoda of male, × 12.
126. Pleopoda of female, × 14.

Abdomen with all six segments separate and exposed. The lateral parts of the first and second are covered by the thorax; the following three have the ends extended and tapering to a point, and bent almost directly backward. The terminal segment has the median part of its dorsal surface depressed or concave; the outline of the segment is triangular, with concave sides tapering behind to a rather sharp triangular point. The basal joints of the uropoda are slightly tapering; they do not reach as far as the tip of the last segment. The external branches are large, rather wide at the base, and tapering gradually to a point. The inner branches are elongate and tapering and lie along the ventral aspect of the last segment of the abdomen but do not quite reach its tip.

Three specimens(Cat. No. 3254) were obtained at Zambi, June 1915. The species has previously been recorded from the Portuguese Congo (Landana, Chinchoxo) and doubtfully (Dollfus, 1898) from Senegal.

BIBLIOGRAPHY

BARNARD, K. H. 1911–1914. Contributions to the Crustacean Fauna of South Africa, Part 3, (1914), Additions to the Marine Isopoda with notes on some previously incompletely known species. Ann. South African Museum, X, pp. 325*a*–358*a*, 359–442, Pls. XXVII–XXXVIII.

BATE, C. S. 1866. Carcinological Gleanings, No. 2. Ann. Mag. Nat. Hist., (3) XVII, pp. 24–31, Pl. II.

BONNIER, J. 1900. Contributions à l'étude des Épicarides—Les Bopyridæ. Trav. Lab. Zool. Wimereux, VIII, pp. 1–396, Pls. I–XLI, text figs. 1–62.
(See also Giard and Bonnier.)

BOVALLIUS, C. 1885. New or imperfectly known Isopoda. Part I, Bihang till k. Svenska Vet. Akad. Handlingar, X, No. 11, pp. 1–32, Pls. I–V.

BRANDT, J. F. 1833. Conspectus Monographiæ Crustaceorum Oniscodorum Latreillii. Bull. Soc. Impér. Nat. Moscou, VI, pp. 171–193.

BUDDE-LUND, G. 1879, Prospectus generum specierumque Crustaceorum Isopodum terrestrum. Copenhagen.

1885. Crustacea Isopoda Terrestria per familias et genera et species descripta, pp. 1–319. Hauniæ.

1898. Die Land-Isopoden Ost-Afrikas, Deutsch Ost-Afrika, IV, 10 pp., 1 Pl.

1899. A revision of Crustacea Isopoda Terrestria with additions and illustrations. Part I. Eubelum. Ent. Meddel., (2) I, pp. 69–97, Pls. I–V.

1904. Same, Part II, Spherilloninæ, Part III, Armadillo. Copenhagen. pp. 33–144, Pls. VI–X.

1908. Isopoda von Madagaskar u. Ostafrika, in Voeltzkow, Reise in Ostafrika in d. Jahren 1903–1905, II, p. 265–308, Pls. XII–XVIII.

1908. Terrestrial Isopoda from Egypt. Res. Swed. Zool. Exped. Egypt, (part 3, No. 5) 12 pp., 1 pl.

1909. Isopoda (1. Land-Isopoden), in Schultze, Zool. u. Anthrop. Ergebn. einer Forschungsreise in west. u. zent. Südafrika, II, pp. 53–70, Pls. V–VII, Jena.

1910. Crustacea. 2, Isopoda, Sjöstedt., Wiss. Ergebn. schwed. zool. Exped. nach d. Kilimandjaro, III, part 21, pp. 3–20, Pls. I, II.

1912. Terrestrial Isopoda. The Percy Sladen Trust Exp. to the Indian Ocean, IV, Trans. Linn. Soc. London, Zool., (2) XV, pp. 367–394, Pls. XX–XXII.
(See also Lönnberg and Budde-Lund.)

CHILTON, C. 1916. Fauna of the Chilka Lake, Mem. Ind. Mus. Calcutta, V, pp. 461–482, figs. 1–22.

DANA, J. D. 1853. Crustacea. U. S. Exploring Exped., XIV, Isopoda,pp. 696–805; Atlas, Pls. XLVI–LIII.

DOLLFUS, A. 1892. Voyage de M. Ch. Alluaud dans le territoire d'Assinie (Afrique occidentale) en juillet et août 1886. Crustacés Isopodes terrestres. Ann. Soc. Entomol. France, LXI, pp. 385–390, Pl. VII.

1893. Notes de géographie zoologique sur la distribution du genre *Ligia* Fabr. Feuille d. jeunes naturalistes, XXIV, pp. 23–26, 4 figs.

1895. Voyage de M. E. Simon dans l'Afrique australe (janvier-avril 1893). Crustacés Isopodes terrestres. Mém. Soc. Zool. France, VIII, pp. 345–352, 9 figs.

1896. Les Isopodes terrestres du nord de l'Afrique du Cap Blanc à Tripoli (Maroc, Algérie, Tunisie, Tripolitaine). Mém. Soc. Zool. France, IX, pp. 523–553, 5 figs.

1897. Les crustacés Isopodes terrestres à grande dispersion. Feuille d. jeunes naturalistes, XXVII, pp. 205–212, 1 map.

1898. Note sur les Isopodes terrestres du Sénégal. Bull. Soc. Zool. France, XXIII, pp. 122–126, 2 figs.

1907. Isopodes terrestres des Indes néerlandaises, in Weber, Zool. Ergeb. Reise Niederland. Ost-Indien, IV, pp. 357–381, Pls. XIII–XV, 29 figs.

Giard, A. and Bonnier, J. 1887. Contributions à l'étude des Bopyriens. Trav. Inst. zool. de Lille et Lab. zool. marit. de Wimereux, V, pp. 1–252, Pl. I–X, text-figs. 1–30.

1890. Prodrome d'une monographie des Épicaridés du Golfe de Naples. Bull. Scient. France et Belgique XXII, pp. 367–391, Paris.

Hansen, H. J. 1890. Cirolanidæ et familiæ nonnullæ propinquæ Musei Hauniensis. Danske Vidensk. Selsk. Skr., (6) V, pp. 239–426, Pls. I–X.

1905. Revision of the European marine forms of the Cirolaninæ, a subfamily of Crustacea Isopoda. Journ. Linnean Soc. London, Zool., XXIX, pp. 337–373, Pls. XXXIII–XXXV.

Hay, W. P. 1917. A new genus and three new species of parasitic isopod crustaceans. Proc. U. S. Nat. Mus., LI, pp. 569–574, Pls. XCVIII–C.

Herklots, J. A. 1870. Deux nouveaux genres de Crustacés vivant en parasites sur des poissons, Epichthys et Ichthyoxenos. Arch. Néerland. Sci. exact. et nat., V, p. 120–137, Pl. V.

Hilgendorf, F. 1893. Die von Herrn Dr. Büttner im Togolande gesammelten Onisciden und zwei neue Macruren. Sitzungsber. Gesell. naturf. Freunde, Berlin, 1893, pp. 152–157.

Kœlbel, C. 1879. Ueber einige neue Cymothoiden, Sitzungsber. k. Akad. Wiss., Wien, (math.-nat. Klasse), LXXVIII (Abt. 1), pp. 401–416, 2 Pls.

Kossmann, R. 1881. Studien über Bopyriden. Zeitschr. wiss. Zool., XXXV, pp. 652–680, Pls. 32-35.

Leach, W. E. 1815. A tabular view of the external Characters of Four Classes of Animals which Linné arranged under Insecta. Trans. Linnean Soc. London, (series 1), XI, pp. 306–400.

1818. Cymothoadées, in Dictionnaire des Sciences naturelles, XII, pp. 338–354.

Lönnberg, E. and Budde-Lund, G. 1912. Crustacea collected by the Swedish Zoological Expedition to British East Africa, 1911. Ark. Zool. k. Svensk. Vetenskpsakad., VII, (No. 26), pp. 1–9, 5 figs.

Miers, E. J. 1881. On a Collection of Crustacea made by Baron Hermann Maltzam on Gorée Island, Senegambia. Ann. Mag. Nat. Hist., (5) VIII, pp. 204–220, 259–281, 364–377, Pls. XIII–XVI. (Isopoda, pp. 369–371 and 376.)

Milne-Edwards, M. 1834–40. Histoire Naturelle des Crustacés. I–III, Pls. I–XLII. Isopoda in III (1840), pp. 115–283, Pls. XXXI–XXXIII.

NICOLET, H. 1849. In Gay, C., Historia de Chile. Zool., III, pp. 256–284, Paris.

NOBILI, G. 1906. Nuovi Bopiridi, Atti R. Acad. Sci. Torino, XLI, pp. 1098–1113, 1 Pl.

1906. Spedizione al Ruwenzori di S. A. R. Luigi Amedeo di Savoia Duca degli Abruzzi, IX. Crostacei. Boll. Mus. Zool. Anat. Torino, XXI, No. 544, pp. 1–2.

1909. Crostacei. Il Ruwenzori, Parte Scientif., I, pp. 357–358.

PERTY, M. 1830–1834. Delectus animalium articulatorum quæ in itinere per Braziliam annis 1817–1820 collegerunt J. B. de Spix et C. V. Ph. de Martius. Monachii.

RICHARDSON, H. 1897. Description of a new species of Sphæroma. Proc. Biol. Soc. Washington, XI, pp. 105–107.

1900. Synopses of North American Invertebrates. VIII. The Isopoda. Amer. Naturalist, XXXIV, pp. 207–230, 295–309, figs. 1–16.

1901. Key to the Isopods of the Atlantic Coast of North America, with descriptions of new and little known species. Proc. U. S. Nat. Mus. XXIII, pp. 493–579, figs. 1–34.

1905. A monograph of the Isopods of North America. Bull. No. 54, U. S. Nat. Mus., pp. i-liii, 1–727; text figs. 1–740.

1902. The marine and terrestrial Isopods of the Bermudas with descriptions of new genera and species. Trans. Connecticut Acad. Sci., XI, pp. 277–310, Pls. XXXVII–XL.

1905. Contributions to the Natural History of the Isopoda. Proc. U. S. Nat. Mus., XXVII, pp. 1-89, 657–681; 131 figs.

1908. Terrestrial Isopods of the family Eubelidæ collected in Liberia by Dr. O. F. Cook. Smithsonian Miscell. Coll., L, pp. 219–247, figs. 50–116.

1910. Marine Isopods collected in the Philippines by the U. S. Fisheries steamer Albatross in 1907–8, Bureau of Fisheries Document No. 736, pp. 1–44, figs. 1–39.

ROUX, J. L. F. 1828. Crustacés de la Mediterranée et de son littoral. Paris et Marseille.

SCHIŒDTE, J. C. AND MEINERT, F. 1879. De Cirolanis Ægas simulantibus. Commentatio brevis, Naturhist. Tidsskr., (3) XII, pp. 279–302, Pls. III–V.

1879–84. Symbolæ ad Monographiam Cymothoarum, Crustaceorum Isopodum Familiæ. Naturhist. Tidsskr. (3) XII, (1879–80), pp. 321–414, Pls. VII–XIII; XIII, (1881–83), pp. 1–166, 281–378, Pls. I–XVI; XIV, (1884), pp. 221–454, Pls. VI–XVIII.

STEBBING, T. R. R. 1900. On Crustacea brought by Dr. Willey from the South Seas, in Willey, Zoological Results based on material collected in New Britain, New Guinea, Loyalty Islands and elsewhere, Part V, pp. 603–690, Pls. LXIV–LXXIV.

1904. Gregarious Crustacea from Ceylon. Spolia Zeylanica, II, pp. 1–29, 6 Pls.

1908. South African Crustacea, (Part 4), Ann. South African Mus., VI, pp. 1–96, Pls. I–XIV.

1908. Zoological Results of the Third Tanganyika Expedition. Report on the Isopoda Terrestria. Proc. Zool. Soc. London, pp. 554–560, Pl. XXVII.

1910. Isopoda from the Indian Ocean and British East Africa. Trans. Linn. Soc. London, Zool., XIV, p. 83–122, Pls. v–xi.

1910. General Catalogue of South African Crustacea. (Part 5 of South African Crustacea for the Marine Investigations in South Africa.) Ann. South African Mus., VI, pp. 281–593, Pls. xv–xxii.

1911. Indian Isopods. Records Indian Museum, Calcutta, VI, pp. 179–191, Pls. x–xii.

Studer, T. 1884. Isopoden, gesammelt während der Reise S. M. S. Gazelle um die Erde 1874–1876. Abh. k. Akad. Wiss. Berlin, 1883, phys.-chem. Abt., pp. 1–28, Pls. i, ii.

Vanhoeffen, E. 1914. Die Isopoden der deutschen Südpolar-Expedition, 1901–1903. Deutsche Südpolar-Exp., XV, pp. 449–598, figs. 1–132.

Wedenissow, T. 1894. Di alcuni crostacei raccolti nel paese dei Somali dall' Ing. L. Brichetti-Robecchi. Bull. Soc. Entomol. Italiana, XXVI, pp. 408–424.

59.57,8 (67.5)

Article VI.—LEPIDOPTERA OF THE CONGO, BEING A SYSTEMATIC LIST OF THE BUTTERFLIES AND MOTHS COLLECTED BY THE AMERICAN MUSEUM OF NATURAL HISTORY CONGO EXPEDITION, TOGETHER WITH DESCRIPTIONS OF SOME HITHERTO UNDESCRIBED SPECIES[1]

By W. J. Holland

Plates VI to XIV and 9 Text Figures

About twenty-five years ago I published a number of papers upon the Lepidoptera of tropical Africa, in which I described numerous forms, which appeared to me to be new to science. These papers appeared in various journals.[2] I am pleased to observe that in most cases the correctness of my judgment with the lapse of time has been confirmed, and but few of the species named in these publications have been relegated to the synonymy. In the case of the moths my industrious and learned friend, Sir George F. Hampson, in his monumental work upon the moths of the world, has in some instances changed the generic references, but has accepted most of the new genera of Heterocera which I proposed, and has allowed my specific names to stand. At the time to which I refer I had in contemplation the preparation of a comprehensive work upon the butterflies of Africa. As a preliminary to this large undertaking I published in the Proceedings of the Zoological Society of London, 1896, pp. 1–104, a 'Synonymic Catalogue of the Hesperiidæ of Africa and the Adjacent Islands.' Shortly after this had appeared I became aware through correspondence that my friend, Dr. Christopher Aurivillius, the Secretary of the Royal Academy of Science in Stockholm, was about to publish a work upon the same subject. It presently appeared under the title 'Rhopalocera Æthiopica.' To my astonishment I discovered that the author had paid me the compliment of omitting from his treatise the great family of the Hesperiidæ, for the reason, as he states in his introduction, that this family had been so thoroughly covered in my recently published paper, that he did not deem it necessary to retraverse the ground. With the appearance of the great work of Dr. Aurivillius the motive to further prosecute my self-imposed labors vanished to a great degree, but my interest in the subject did not altogether cease. Though busy with many other things, and becoming more and more absorbed in paleontological researches, I still cherished a fondness for that particular faunal nook in which I had passed so much time with pleasure, and kept on from time to time adding to my collection, and latterly to that of the Carnegie Museum, as opportunities presented themselves. The result has been the gradual accumulation of a collection of the insects of Africa, and particularly of the Lepidoptera, which is one of the largest in the world. It is indeed far from complete, but, nevertheless, contains many thousands of species and a vast assemblage of specimens.

---

[1] Scientific Results of the American Museum Congo Expedition. Entomology, No. 6.

[2] Entomological News, Psyche, Annals and Magazine of Natural History, Canadian Entomologist, Proceedings of the U. S. National Museum, and Proceedings of the Zoological Society of London.

At this point I am tempted to narrate a little incident, which I have never recorded, but which is recalled to me as I am writing these preliminary notes. In the summer of 1903 it became my duty to repair to Brussels in order to supervise the removal from that city to Pittsburgh of the great paleontological collection which had been brought together by Baron Ernst Bayet, and which Mr. Andrew Carnegie had instructed me to secure for the museum of which I have the honor to be the Director. His Majesty, King Leopold, on the day set apart to celebrate Belgian Independence, sent me an invitation to lunch with him at the Royal Palace. The Court was in attendance, because at half-past two o'clock in the afternoon the king, attended by his ministers, was to repair in state to the church of St. Gudule to join in the *Te Deum.* After having been presented to the ladies and gentlemen of the Court who were in waiting, I was introduced to Sir Ernst Cassel, the only other guest, and then the king was announced. He entered the room with the Princess Clementine upon his arm, came forward and greeted Sir Ernst and me, turned the Princess Clementine over to me to escort to table, and then with Cassel at his side bade the assembled company follow on into the apartment where refreshments were provided. I found myself seated between the King and the Princess. Conversation went on merrily, and finally a mischievous notion occurred to me, and, turning to the king, I said "Your Majesty, I have a favor to ask of you, which I am sure you will be willing to grant, and the propriety of asking for which I am sure you will recognize." He looked me in the face and answered, "My dear Doctor, I shall be happy to serve you, if I can, but what is the favor you wish?" I replied, "Your Majesty, I wish a concession in the Congo Free State." "A concession in the Congo Free State!" he exclaimed, and I saw a look of astonishment pass over the faces of a number of those at the table. "Yes, your Majesty. But I must explain myself fully. For many years I have been interested in

African entomology, and have named and described many species of butterflies and moths from the region over which you in part bear rule. I wish to go on with my work, and I therefore wish you to issue a decree that the insect tribes of the Congo shall at a given date depute two of each species, a male and a female, to surrender themselves as hostages of science to whomsoever you may appoint to receive them, they then to be turned over to me that I may go on with the good work of finishing the task, which Adam left incomplete, of naming the living things on the globe." The king laughed, and answered, "Doctor, you are as great a flatterer as the man who told King Canute to order the waves of the sea to retire before him." "What?" I replied, "is it possible that the royal prerogative does not extend so far?" "I am afraid it does not," he answered, "but I will tell you what to do. Go to the Congo Museum and tell the Director that it is my wish that he shall turn over to you all the butterflies which he has not yet named, so that your wish may be gratified." "Your Majesty," I answered, "I know the Director of the Congo Museum, and unless you give me a note to the effect just stated, I am sure I shall not get a single butterfly into my hands." The king laughed and retorted, "Aha! I discover that he is a faithful servant of mine." We both laughed, and that was the end of this particular bit of our conversation.

About two years ago I happened to visit The American Museum of Natural History and, among other things, was shown the large collection of Lepidoptera which had been brought back from the interior of the Congo State by Messrs. Lang and Chapin. The gentlemen in charge requested me to undertake the task of arranging and classifying the Lepidoptera. In a moment of weakness I acceded to the request, but with the proviso that they must not expect from me an immediate report, in view of the fact that my duties were already very numerous and that the work would have to be done at odd moments of time. The collections were sent to me, the butterflies being, I think, more in number than were in the Congo Museum in 1903. The result is the list herewith presented, which represents work done in the midst of incessant interruptions, or at times given to me for rest and vacation, or when others have been in bed and asleep. It has been a labor of love. I hope that to some extent it may help students of the future.

It is hardly necessary for me to enter into a lengthy and detailed discussion of the relationship of the Ethiopian faunal region with those of other parts of the globe. It suffices to say that, while the lepidopterous fauna of those parts of Africa which border immediately upon the

Mediterranean is distinctly palæarctic, the fauna of the lands lying south of the Sahara and traversed by the great river systems of the continent is more nearly related to the Indo-Malaysian fauna, but possesses a number of genera and species which occur nowhere else upon the globe. Beginning in the southern part of Senegal, in latitude 12 ° N., and extending eastward and southward to the headwaters of the various affluents of the Congo and the Coanza, there is a more or less densely forested region, thoughout which the flora and fauna with slight modifications are practically the same. Southern and eastern Africa are characterized by the presence of great expanses of grass-land, save along the watercourses. This territory, in which there is more or less aridity, extends northwest from the region of Uganda and thence west about the headwaters of the various rivers flowing into the Atlantic south of the Sahara, forming a selvage between the hot densely forested junglelands to the south and the dry desert-lands to the north. Here and there the forested country is interrupted, as in Angola and various points along the western coast, by smaller tracts where the forests are less luxuriant and open grass-lands occur. The lepidopterous fauna of the grass-lands, which until the end of the last century have been the home of vast herds of ruminant animals, reveals the predominance of certain genera, such as *Teracolus*, which are characteristic also of Abyssinia, Arabia, and southern India. The humid jungles along the Coanza, the Congo and its tributaries, the Ogové, the lower Niger, and the various rivers emptying into the Atlantic from Lagos to Dakar are the home of a fauna which by common consent is known as West African. Here is the metropolis of the African Nymphalidæ, of various mimetic forms of Lycænidæ belonging to the genera of the subfamily Lipteninæ and of various genera of the Hesperiidæ, which are found nowhere else upon the globe. Here and there this great forest region is invaded on its eastern and northern borders by inwardly projecting stretches of the surrounding grass-lands, and there is thus noted a transition on its periphery from the West African fauna to the South African or East African fauna. In fact, the East African fauna and South African fauna reappear on the north and northwest of the irregular territory in which the West African fauna occurs. At the very mouth of the Congo there occurs in the region of Matadi an intrusion into the West African region of some forms which may properly be considered as characteristic of the South and East African fauna.

The largest portion of the collection returned by the American Museum Congo Expedition was obtained at Medje, a point near the

Nepoko River in the very heart of the forest. The collections at Medje were principally made from April until September, 1910. A number of specimens are recorded as taken at points not far distant from Medje, such as Gamangui, Bafwabaka, and Avakubi. In the fall of the year 1910 and thereafter during the year 1912 considerable collecting was done at Niangara and Faradje, the former on the Uelle River, the latter upon the Dungu, an eastern affluent of the Uelle. The collections from Niangara and Faradje reveal the fact that those localities, while still within the limits of the West African subregion, are nevertheless not far from the line of contact with the East African, or Abyssinian, region which sends a long, narrow, westward projection south of the Sahara toward the mouth of the Senegal. Specimens were occasionally taken in the course of the journeyings of the members of the expedition at various points throughout the region from Angola eastward, and the labels attached to the insects reveal captures made at such points as Matadi, Basoko, Stanleyville, and Bafwaboli. Regular and systematic collecting, however, seems to have been confined largely to the three points already indicated, Medje, Niangara, and Faradje, and more than nine-tenths of the specimens brought back bear these locality labels. The collection as a whole has a distinctly West African *facies*.

The collection is one of the largest which has been made in recent years in that region. I am given to understand by the gentlemen who made it that to a considerable extent they employed the assistance of natives. It is particularly rich in the larger and showier species, especially of the Nymphalidæ, which are characteristic of the territory visited. But little attention was paid to the moths, which is much to be regretted, as it is among these that the greatest number of novelties might have been expected to occur. Mr. Lang tells me that little colecting was done at night. The smaller diurnal lepidoptera are also but scantily represented. This is particularly true of the Lycænidæ and the Hesperiidæ. Of course I understand the principal aim of the expedition was to collect vertebrates. The making of entomological collections was more or less a subsidiary purpose. Nevertheless, it is upon the whole an extensive collection, containing not far from nine thousand specimens, representing more than seven hundred and twenty-five species and varieties. Most of the specimens are in good condition, and, while not yielding as many species new to science as I had hoped might be the case, it gives the American Museum a fine nucleus upon which to build in coming years.

In preparing the following list I have acted upon the suggestion of Mr. Lang to give a reference to the most easily accessible illustration of each species. In a few cases no illustration has as yet been published, in other cases the only illustration is in a recondite corner of the literature, and I have not in some such instances taken the pains to cite the figure, as the specialist interested in the subject will know as well as I how to find such illustrations. I have constantly referred, in the case of the butterflies, to the illustrations given by Aurivillius in Vol. XIII of Seitz's 'Die Gross-Schmetterlinge der Erde.' This volume gives, for the most part, very good figures of the Rhopalocera of the Ethiopian region. The copy in my possession unfortunately is incomplete, its publication apparently having been interrupted at the outbreak of the war. At all events, since the fall of 1914 no parts of the book which was being issued at Leipzig have come to hand.[1]

In no instance have I endeavored to give a complete synonymy where a species has been frequently mentioned in the literature of the subject. I have, however, endeavored in all cases to cite the original description or figure of the species and have followed this by citation of one of the latest references to that species, or of the subspecies, in case a subspecific reference is called for. The student who desires to explore the synonymy may consult among other works the 'Rhopalocera Æthiopica' of Dr. Aurivillius and the revisions published by Rothschild and Jordan in the 'Novitates Zoologicæ' of the genera *Charaxes*, *Papilio*, and the family Sphingidæ. The synonymy of the Hesperiidæ published up to the year 1895 is given quite completely in my 'Synonymic Catalogue of the Hesperiidæ of Africa,' and so forth (cf. Proc. Zool. Soc. London, 1896). In studying the moths, reference should be made to Sir George F. Hampson's 'Catalogue of the Phalænæ' so far as published. Assistance may be derived from Kirby's 'Catalogue of the Lepidoptera-Heterocera,' but this work must be used with caution for, although references to the literature are correct, many species have in recent years been assigned to other genera than those under which Kirby listed them. In studying the Pyraustids and allied groups the writings of Sir George F. Hampson must be consulted, and in studying the Geometridæ it is necessary to consult various papers published in recent years by Warren, a number of which appeared in the 'Novitates Zoologicæ.'

---

[1] The edition I have is that published in the German language between which and that published in the English language there may be a few slight discrepancies in the pagination.

I have not attempted to give in connection with this paper a complete bibliography of the subject, as such an undertaking seems unnecessary in the case of any student who has access to the works mentioned above and to the 'Zoological Record.' A complete bibliography would constitute a considerable volume in itself.

Before closing these brief introductory notes I desire to express my sincere gratitude to Dr. F. E. Lutz and his amiable associates in the Department of Invertebrate Zoology in The American Museum of Natural History, and to the Director of the Museum, Dr. F. A. Lucas, who kindly granted me the privilege of reserving for our collections in Pittsburgh a small series of duplicates of each species in cases where there were duplicate specimens in sufficient number to permit the writer to retain a few. For this generous permission, as well as for the uniformly kind indulgence shown me by the officials of The American Museum of Natural History, I desire to express my thanks. To Mr. Herbert Lang, the leader of the expedition, I am indebted for a number of kind letters written to me in answer to inquiries made during the progress of my work.

APPROXIMATE LOCATION OF PLACES MENTIONED IN THIS PAPER

Avakubi.—1° 20′ N., 27° 40′ E.
Bafwabaka.—2° 10′ N., 27° 50′ E.
Bafwaboli.—0° 40′ N., 26° 10′ E.
Bafwasende.—1° 10′ N., 27° 15′ E.
Banalia.—1° 30′ N., 25° 40′ E.
Banana.—6° S., 12° 20′ E.
Banza Manteka.—5° 30′ S., 13° 50′ E.
Barumbu.—1° 10′ N., 23° 20′ E.
Basoko.—1° 20′ N., 23° 35′ E.
Batama.—1° N., 26° 40′ E.
Benito.—1° 35′ N., 9° 35′ E.
Bolengi.—0° 5′ S., 18° 10′ E.
Boma.—5° 50′ S., 13° 10′ E.
Boyulu.—1° N., 27° E.
Bumba.—2° 10′ N., 22° 30′ E.
Duala.—4° N., 9° 40′ E.
Efulen.—2° 40′ N., 10° 45′ E.
Faradje.—3° 40′ N., 29° 40′ E.
Fernando Po.—3° 30′ N., 8° 30′ E.
Freetown.—8° 30′ N., 13° 15′ W.
Gamangui.—2° 10′ N., 27° 20′ E.
Isangi.—0° 50′ N., 24° 15′ E.
Isiro.—2° 50′ N., 27° 50′ E.
Ja R.—2° to 3° 30′ N., 12° 25′ to 15° E.
Kangvé.—0° 45′ S., 9° E.
Kwamouth.—3° 20′ S., 16° 10′ E.
Leopoldville.—4° 25′ S., 15° 20′ E.
Lolodorf.—3° 15′ N., 10° 40′ E.
Lubila R.—1° N., 26° 30′ E.
Lukolela.—1° 10′ S., 17° 10′ E.
Malela.—6° S., 12° 40′ E.
Matadi.—5° 50′ S., 13° 35′ E.
Medje.—2° 25′ N., 27° 30′ E.
Munie Katoto.— 0° 35′ N., 26° 5′ E.
Ngayu.—1° 40′ N., 27° 40′ E.
Niangara.—3° 40′ N., 27° 50′ E.
Noki.—5° 50′ S., 13° 30′ E.
Nouvelle Anvers.—1° 40′ N., 19° 10′ E.
Ogové R.—1° S., 10° E.
Panga.—1° 45′ N., 26° 15′ E.
Pawa.—2° 25′ N., 27° 50′ E.
Poko.—3° 10′ N., 26° 50′ E.
Risimu.—1° N., 26° 45′ E.
Stanleyville.—0° 30′ N., 25° 15′ E.
Ukaturaka.—2° N., 20° 30′ E.

NEW GENERA, WITH THEIR TYPE SPECIES

	PAGE
Kallimula; type, *K. osborni*, new species	149
Neptidomima; type, *Neptis exaleuca* Karsch	164

NEW SPECIES AND VARIETIES, WITH THEIR TYPE LOCALITIES

	PAGE
Bicyclus medontias var. *obsoletus.* Medje	132
Mycalesis langi. Medje	139
“ *chapini.* Niangara	140
Precis stygia var. *fuscata.* Medje	148
Kallimula osborni. Medje	150
Hypolimnas bartteloti var. *obliterata.* Medje	156
Euphædra preussi var. *notata.* Medje	173
“ “ “ *subviridis.* Medje	174
“ “ “ *fulvofasciata.* Medje	174
“ “ “ *latefasciata.* Medje	175
“ “ “ *angustior.* Medje	175
“ *inanoides.* Medje	175
“ *rezioides.* Medje	177
“ *xypete* var. *maxima.* Medje	178
“ *cyanea.* Medje	178
“ *medon* var. *innotata.* Medje	179
Euryphene lucasi. Medje	183
Diestogyna kahli. Medje	191
“ *rotundata.* Medje	191
Cymothoë herminia var. *poënsis.* Fernando Po	196
“ *langi.* Medje	197
“ *capellides.* Medje	198
“ *cænis* form *rubida.* Medje	199
“ *Reginæ-Elizabethæ.* Medje	201
“ *ogova* var. *rubescens.* Kangvé	203
Charaxes protoclea var. *marginepunctata.* Gaboon	206
Telipna rothioides. Medje	214
“ *medjensis.* Medje	214
Epitola langi. Medje	217
Deudorix batikelides. Niangara	221
Spindasis chapini. Niangara	225
Triclema lutzi. Medje	229
Oboronia ornata var. *flava.* Benito	235
Mylothris spica form *donovani.* Niangara	236
Papilio ridleyanus var. *fumosus.* Bafwasende	247
Abantis rubra. Medje	253
Leptalina niangarensis. Niangara	256
Myopsyche langi. Medje	262
Metarctia chapini. Medje	264
Nola bananæ. Banana	266

Deilemera (?) *anomala*. Benito	268
Xanthospilopteryx medjensis. Medje	271
Eutelia nigricans. Bolengi	274
Pseudogonitis variabilis. Lolodorf	275
Leocyma congoënsis. Ukaturaka	277
Dermaleipa nubilata. Avakubi	278
Tolna bolengensis. Bolengi	280
Sphingomorpha aliena. Banza Manteka	285
Rhynchodes avakubi. Avakubi	287
" *efulensis*. Cameroon	287
Amphigonia hyalinata. Stanleyville	288
Heterospila (?) *rubida*. Medje	289
Deinypena morosa. Medje	291
" " var. *pallidior*. Ukaturaka	292
" *fulvida*. Medje	292
" *multilineata*. Medje	292
" *transversata*. Kangvé	293
" *obscura*. Medje	294
Sapelia bipunctata. Medje	295
Leucoperina kahli. Cameroon	296
Lœlia hildoides. Efulen	298
" *soloides*. Medje	299
Phasicnecus grandiplaga. Medje	304
Ctenogyna (?) *medjensis*. Medje	305
Rhamidava (?) *pieridaria*. Medje	307
Pitthea famulita. Medje	310
Gonanticlea (?) *langaria*. Medje	311
Acidalia (?) *medjaria*. Medje	312
Osteosema (?) *phyllobrota*. Medje	313
Pseudoterpna (?) *chapinaria*. Belgian Congo	314
Eudæmonia brachyura var. *minor*. Sierra Leone	316
Callocossus langi. Faradje	318
Leipoxais punctulata. Efulen	320
Chrysopoloma nubila. Niangara	322
Saliunca rubriventris. Stanleyville	324
Proterozeuxis (?) *medjensis*. Medje	325
Phryganodes sex-guttata. Bolengi	328

The following new names are proposed in this paper:

Mylothris spica form *donovani* Holland, p. 236, ♀ of *M. spica* (Mœschler) = ♀ *Papilio rhodope* Donovan, not ♀ of *P. rhodope* Fabricius.

Anua hampsoni Holland, p. 280, for *Anua producta* Hampson, 1913, not *A. producta* Holland, 1894.

I. RHOPALOCERA

Danaidæ

DANAIS[1] Latreille

(1) 1. **Danais chrysippus** (Linnæus)

Papilio chrysippus LINNÆUS, 1758, Syst. Nat., 10th Ed., p. 471.
Danaida chrysippus AURIVILLIUS, 1911, Seitz, Gross-Schmett., XIII, p. 71.

In the entire collection, consisting of one hundred and ninety-seven specimens of this species, there are only thirteen individuals which can be referred to the typical form, *D. chrysippus,* and even these show traces on the hind wings of the white squamation, which is characteristic of the varietal form *D. alcippus.* As in the case of the latter form, they fall into two categories, those in which the upper side of the wings is bright rufous and those in which it is dark chestnut or maroon. Noki, Kwamouth, Medje, Niangara, and Faradje.

(2) 1*a*. **Danais chrysippus alcippus** (Cramer)

Papilio alcippus CRAMER, 1777, Pap. Exot., II, p. 45, Pl. CXXVII, figs. *E*, *F*.
Danaida alcippus AURIVILLIUS, 1910, Seitz, Gross-Schmett., XIII, p. 72.

One hundred and eighty-four specimens are referable to this varietal form. There is great variation in the shading of the wings. Some have the color of the fore wings bright rufous, others dark chestnut, while one aberrant male has both the fore and the hind wings prevalently pale argillaceous. The majority of the specimens have the hind wings broadly white, which is the typical form, but there are many specimens in which the white is reduced in extent until in some they nearly approach the condition which prevails in typical *D. chrysippus*, in which the white color is totally lacking. I find it utterly impossible by associating the specimens under the dates of capture, or according to the localities given upon the labels, to divide them into seasonal or local races. According to the labels, captures took place in January and February, then again in June, July, and August, and still later in November. From this it appears probable that there are at least two annual broods, and the insect may be on the wing throughout the year. Isangi, Avakubi, Gamangui, Risimu, Niangara, Medje, Bafwabaka, and Faradje.

---

[1] As every student knows, the word *Danaus*, first introduced by Linnæus into entomological nomenclature, was not by him and cannot be by us employed in a strictly generic sense.

Aurivillius has resuscitated the name *Danaida* originally employed by Latreille, but for which he latter substituted *Danaus* and finally *Danais*. An author surely has a right to correct himself and amend his nomenclature. Latreille did this and, as *Danais* has been universally employed for a century, it seems to the writer an excess of obedience to "the law of priority" to fish up Latreille's long abandoned and forgotten name and apply it again.

(3) 2. **Danais petiverana** Doubleday and Hewitson

Danais petiverana Doubleday and Hewitson, 1857, Gen. Diurn. Lep., I, p. 93, Pl. xii, fig. 1.

Danaida petiverana, Aurivillius, 1911, Seitz, Gross-Schmett., XIII, p. 72, Pl. xxiii*a.*

This is the African form of *D. limniace* (Cramer). The collection contains thirty-four males, taken mostly at Medje in June, July, and August, though there are a number captured at Niangara in November, and several from other localities: Bafwasende, Bafwaboli, Risimu, Faradje.

Amauris Hübner

(4) 1. **Amauris niavius** (Linnæus)

Papilio niavius Linnæus, 1758, Syst. Nat., 10th Ed., p. 470.

Amauris niavius Aurivillius, 1911, Seitz, Gross-Schmett., XIII, p. 74, Pl. xxiii*d.*

There are twenty-five specimens, of which three (two of them not expanded) are females. The most of them were taken at Medje from July to September, though a few are labelled as taken at Niangara in November.

(5) 2. **Amauris damocles** (Palisot de Beauvois)

Papilio damocles Palisot de Beauvois, 1805–1821, Ins. Rec. en Afrique et Amérique, Lép., p. 239, Pl. vi, figs. 3*a*, 3*b*.

Amauris damocles Aurivillius, 1911, Seitz, Gross-Schmett., XIII, p. 74.

This common species is represented in the collection by twenty-eight males and two females. A few are labelled as having been captured at Gamangui in February, most of them were taken at Medje about the middle of the year, and a few were captured at Niangara in November.

(6) 3. **Amauris psyttalea** Plœtz

Amauris psyttalea Plœtz, 1880, Stett. Ent. Zeit., XLI, p. 189. Aurivillius, 1911, Seitz, Gross-Schmett., XIII, p. 74, Pl. xxv*a.*

This species is discriminated from the preceding by the fact that the white basal area of the hind wing reaches the tip or goes a little beyond the tip of the cell, while in *A. damocles* it does not, and by the further fact that the outer angle of the hind wing is adorned on the upper side by a continuous band of marginal spots.

There are twenty-four males in the collection. They were taken at various localities and at different dates from July to December.

(7) 4. **Amauris damoclides** Staudinger

Amauris damoclides STAUDINGER, 1896, Iris, VIII, p. 367, Pl. VII, fig. 3. AURIVILLIUS, 1911, Seitz, Gross-Schmett., XIII, p. 74, Pl. XXV*b*.

There are two specimens of this species, one taken at Medje in July, the other at Avakubi in November.

(8) 5. **Amauris tartarea** Mabille

Amauris tartarea MABILLE, 1876, Bull. Soc. Zool. France, I, p. 199. AURIVILLIUS, 1911, Seitz, Gross-Schmett., XIII, p. 74, Pl. XXV*a*.

Six males, five taken at Medje in June, July, and August, and one at Niangara in November.

(9) 6. **Amauris hecate** Butler

Amauris hecate BUTLER, 1866, Proc. Zool. Soc. London, p. 44. AURIVILLIUS, 1911, Seitz, Gross-Schmett., XIII, p. 75, Pl. XXIV*b*.

Fifteen males, one taken at Stanleyville in August 1909, one at Gamangui in February, two at Medje in September, six at Avakubi in November, and five at Niangara in the same month.

(10) 7. **Amauris hyalites** Butler

Amauris hyalites BUTLER, 1874, Cist. Ent., I, p. 209. AURIVILLIUS, 1911, Seitz, Gross-Schmett., XIII, p. 76, Pl. XXIV*a*.

Of this species the collection contains forty-six males and five females. Most of the specimens were taken at Niangara in November, but quite a number are labelled as from Medje and other localities and were taken in the midsummer months.

Acræidæ

PLANEMA Doubleday and Hewitson

(11) 1. **Planema epæa** (Cramer)

Papilio epæa CRAMER, 1779, Pap. Exot., III, p. 64, Pl. CCXXX, figs. *B, C*.
Planema epæa AURIVILLIUS, 1913, Seitz, Gross-Schmett., XIII, p. 245, Pl. LVIII*a*.

The collection contains five males and seventeen females, all of which were taken at Medje from July to September, except one female which was collected at Faradje, "1911–1912."

(12) 2. **Planema tellus** Aurivillius

Planema tellus AURIVILLIUS, 1893, Ent. Tidskr., XIV, p. 280, fig. 7; 1913, Seitz, Gross-Schmett., XIII, p. 245, Pl. LVIII*a*.

Two males taken at Medje, one on June 6, the other on July 30, 1910.

(13) 3. **Planema epiprotea** Butler

Planema epiprotea BUTLER, 1874, Cist. Ent., I, p. 210. AURIVILLIUS, 1913, Seitz, Gross-Schmett., XIII, p. 245, Pl. LVIII*b*.

Twelve females taken at Medje from May to September.

(14) 4. **Planema consanguinea** Aurivillius

Planema consanguinea AURIVILLIUS, 1893, Ent. Tidskr., XIV, p. 282, fig. 8; 1913, Seitz, Gross-Schmett., XIII, p. 244, Pl. LVIII*b*.

Two males caught at Medje, one in July, the other in September.

(15) 5. **Planema elongata** Butler

Planema elongata BUTLER, 1874, Cist. Ent., I, p. 212. AURIVILLIUS, 1913, Seitz, Gross-Schmett., XIII, p. 244, Pl. LVIII*b, c*.

A single female taken at Medje, August 1, 1910.

(16) 6. **Planema pseudeuryta** Godman and Salvin

Planema pseudeuryta GODMAN AND SALVIN, 1890, Story of the Rear Column, p. 429.
Planema dewitzi STAUDINGER, 1896, Iris, IX, p. 209, Pl. II, fig. 5.
Planema pseudeuryta AURIVILLIUS, 1913, Seitz, Gross-Schmett., XIII, p. 243, Pl. LVIII*c*.

I refer to this species a single male taken at Medje, May 6, 1910.

(17) 7. **Planema nelsoni** (Smith and Kirby)

Plate VI: Figure 1, ♂; Figure 2, ♀

Acræa nelsoni SMITH AND KIRBY, 1892, Rhop. Exot., I, *Acræa*, Pl. III, figs. 9, 10.

I refer to this species a male captured at Niangara, November 26, and a female taken at Medje, August 24, 1910. As the female of *P. nelsoni* has never been described or figured, I give on Plate VI a representation of this female, and also of the male, for purposes of comparison. The insect has been erroneously identified with *P. poggei* Dewitz.

(18) 8. **Planema alcinoë** (Felder)

Acræa alcinoë FELDER, 1865–1867, Reise Novara, Lep., III, p. 368, Pl. XLVI, figs. 12, 13.

Planema alcinoë AURIVILLIUS, 1913, Seitz, Gross-Schmett., XIII, p. 241, Pl. LVII*f*.

I assign to this species seven females, six taken at Medje at dates ranging from May 6 to September 1, and another female taken at Niangara, November 26, 1910. They agree very closely with specimens in my collection determined as *P. alcinoë* by the late Dr. Otto Staudinger, except that the discal area of the hind wings is pure white and not creamy white, as is the case in the specimens sent me from Dresden. It is possible that they may belong to a closely allied species, but there is no way of certainly determining this. The association of the sexes in some species of this genus without the help of correct data obtained in the field is a matter of conjecture, as the females of related species are very much alike.

(19) 9. **Planema macaria** (Fabricius)

Papilio macaria Fabricius, 1793, Ent. Syst., III, part 1, p. 174.
Planema macaria Aurivillius, 1913, Seitz, Gross-Schmett., XIII, p. 240, Pl. lvii*f*.

One male caught at Medje, August 1, 1910.

Acræa Fabricius

(20) 1. **Acræa alciope** Hewitson

Acræa alciope Hewitson, 1852, Exot. Butt., I, *Acræa*, Pl. i, figs. 4, 5.
Acræa fumida Eltringham, 1912, Trans. Ent. Soc. London, p. 325, ♀.
Acræa bakossua Strand, 1912, Archiv f. Naturg., LXXVII, part 1, Suppl. 4, p. 114, ♀.
Acræa macarina Butler, 1868, Proc. Zool. Soc. London, p. 221, Pl. xvii, fig. 6, ♀.
Acræa aurivillii Staudinger, 1896, Iris, IX, p. 209, Pl. ii, fig. 2, ♀.
Acræa alciope Aurivillius, 1913, Seitz, Gross-Schmett., XIII, p. 248, Pl. lvii*e*, ♂.

The collection contains sixty-five males and forty-one females of this species and its varieties. The males are all quite alike, except seven which do not have the ground-color of the wings a bright pale orange-yellow, which is the normal color, but are dull brownish, and the darker markings are not deep black but grayish black. There is also a single female which, in these respects, is like the males I am describing and agrees perfectly with the description of a female to which Eltringham applied the subspecific name of *fumida* (cf. Eltringham, *loc. cit.*). The name used by Eltringham is, in my judgment, also to be applied to these males, and the aberration is evidently not in this case confined merely to the female sex. Most of the aberrant female forms described by authors are represented in the batch of specimens before me. There are several specimens referable to the form dubbed *macarina* by Dr. Butler, in which the margin of the hind wings is not marked with a dark band; of the form named *aurivillii* by Dr. Staudinger, in which the hind wings are crossed on the middle by a band of white of varying degrees of intensity; and of the variety named *bakossua* by Strand, in which the costal third of the transverse median band of the fore wings is whitish. And there are some intergrading forms which the writer, if he were a professed "species-maker" and not engaged in other and more important matters, might be tempted to describe and tag with so-called subspecific names. These forms are mimetic, and some interesting observations concerning them are contained in Eltringham's work which is cited above.

The vast majority of the specimens were taken at Medje, and mainly in the months of June and July. There are about half a score of specimens which bear other locality labels, but they give no hint whatever of the existence of "local races." All of the varietal forms mentioned above occurred at Medje and were taken at the same dates. Specimens labelled as from Bafwaboli (Munie Katoto), Bafwasende, Batama, Lubila, and Risimu are dated as captured in September; one from Avakubi is dated October, another from Niangara bears the date of November, and one from Gamangui was taken in February. The writer has specimens in his collection taken in Cameroon and the French Congo in March, April, and May, and it is probable that the insect may be found upon the wing more or less commonly all the year round in the regions which it frequents.

(21) 2. **Acræa jodutta** (Fabricius)

Papilio jodutta Fabricius, 1793, Ent. Syst., III, part 1, p. 175.
Acræa jodutta Aurivillius, 1913, Seitz, Gross-Schmett., XIII, p. 249, Pl. lvii*e*.

There are fifteen males and four females, most of them taken at Medje from June to September. Of the females, two are of the typical white form and two of the form named *dorotheæ* by Miss Emile Sharpe (figured as *A. metaprotea* Butler, in Seitz, XIII, Pl. lvii*d*) taken at Medje, June 20, 1910.

(22) 3. **Acræa lycoa** Godart

Acræa lycoa Godart, 1819, Enc. Méth., IX, p. 239. Aurivillius, 1913, Seitz, Gross-Schmett., XIII, p. 250.

There are five males and thirty-seven females in the collection. The specimens were mostly taken at Medje from June to September, but there are two females from Batama, two others from Risimu, and a fifth from Bafwaboli (Munie Katoto), which are all dated as captured in September.

(23) 4. **Acræa semivitrea** Aurivillius

Acræa semivitrea Aurivillius, 1895, Ent. Tidskr., XVI, p. 111; 1913, Seitz, Gross-Schmett., XIII, p. 253, Pl. lvii*b*.

Three males taken at Medje, one in June, the other two in August.

(24) 5. **Acræa servona** Godart

Acræa servona Godart, 1819, Enc. Méth., IX, p. 239. Aurivillius, 1913, Seitz, Gross-Schmett., XIII, p. 253, Pl. lvii*b*.

Twenty-six males and one female, all taken at Medje (June-August), except one male captured at Lubila, September 20, 1909, and the single female caught at Gamangui, June 7, 1910.

(25) 6. **Acræa penelope** Staudinger

Acræa penelope Staudinger, 1896, Iris, IX, p. 195. Aurivillius, 1913, Seitz, Gross-Schmett., XIII, p. 254, Pl. lviii*b*.

Fifteen males: three from Gamangui, two taken in February and one in June; seven from Medje caught June to August; two from Risimu and three from Munie Katoto taken in September.

(26) 7. **Acræa peneleos** Ward

Acræa peneleos Ward, 1871, Ent. Mo. Mag., VIII, p. 60. Aurivillius, 1913, Seitz, Gross-Schmett., XIII, p. 255, Pl. lviii*b* (first figure).

Twenty-nine males mostly taken at Medje, although there are others taken at the same localities and in the same months as those recorded for the preceding species. Lubila, Munie Katoto, Gamangui, Ngayu, Risimu, and Boyulu.

(27) 7*a*. **Acræa peneleos pelasgius** (Grose-Smith)

Acræa pelasgius Grose-Smith, 1900, Nov. Zool., VII, p. 545. Smith and Kirby, 1901, Rhop. Exot., III, *Acræa*, Pl. vii, figs. 9, 10.

Eighteen specimens, all from Medje (April to August), except one caught at Niangara in November.

(28) 8. **Acræa parrhasia** (Fabricius)

Papilio parrhasia Fabricius, 1793, Ent. Syst., III, part 1, p. 175.

Acræa parrhasia Aurivllius, 1913, Seitz, Gross-Schmett., XIII, p. 255, Pls. lvii*a*, lix*e*.

One male, Munie Katoto, September 10, 1909.

(29) 9. **Acræa orina** Hewitson

Acræa orina Hewitson, 1874, Ent. Mo. Mag., XI, p. 130; 1875, Exot. Butt., V, *Acræa*, Pl. vii, figs. 43, 48.

There are thirty-one specimens, the majority of which were taken at Medje at dates ranging from May to September. Two are from Gamangui, one caught in February, the other in June; one from Stanleyville, August 1, 1909; one from Isangi, August 11, 1909; one from each of the localities known as Pawa, Munie Katoto, and Avakubi, captured in the month of October.

(30) 10. **Acræa orestia** Hewitson

Acræa orestia Hewitson, 1874, Ent. Mo. Mag., XI, p. 131; 1875, Exot. Butt., V, *Acræa*, Pl. vii, fig. 47.

One male caught at Medje in September 1910.

(31) 11. **Acræa quirinalis** Grose-Smith

Acræa quirinalis GROSE-SMITH, 1900, Nov. Zool., VII, p. 544. SMITH AND KIRBY, 1901, Rhop. Exot., III, *Acræa*, Pl. VII, figs. 5, 6.

Two males and three females captured at Medje (June to August).

(32) 12. **Acræa vesperalis** Grose-Smith

Acræa vesperalis GROSE-SMITH, 1890, Proc. Zool. Soc. London, p. 466. SMITH AND KIRBY, 1892, Rhop. Exot., I, *Acræa*, Pl. III, figs. 1, 2.

One female taken in the first week of August 1910, at Medje.

(33) 13. **Acræa pentapolis** Ward

Acræa pentapolis WARD, 1871, Ent. Mo. Mag., VIII, p. 60; 1872, Afr. Lep., p. 7, Pl. VI, fig. 2. AURIVILLIUS, 1913, Seitz, Gross-Schmett., XIII, p. 257, Pl. LVI*e*.

Two captured at Medje in June. This species is ordinarily not common in collections, but we have recently received a very large series, which Mr. A. I. Good informs me were part of a huge swarm which passed a couple of years ago over Efulen in Cameroon, flying from the north toward the south, in such numbers as to call for comment even on the part of the natives.

(34) 13*a*. **Acræa pentapolis thelestis** (Oberthür)

Acræa thelestis OBERTHÜR, 1893, Études d'Entomologie, XVII, p. 17, Pl. III, fig. 33. AURIVILLIUS, 1913, Seitz, Gross-Schmett., XIII, p. 257, Pl. LVI*f*.

This is a form of the preceding species in which the white patch on the hind wing of *A. pentapolis* is replaced by red. Breeding experiments made at Lagos by Lamborn have shown that the two forms emerge in about equal numbers from the chrysalids reared from the same batch of eggs. The collection contains one specimen taken at Medje, September 1, 1910.

(35) 14. **Acræa encedon** (Linnæus)

Papilio encedon LINNÆUS, 1758, Syst. Nat., 10th Ed., p. 488.
Acræa encedon AURIVILLIUS, 1913, Seitz, Gross-Schmett., XIII, p. 258, Pl. LVI*e*.

One male labelled "Pawa, Oct. 20"; two females taken at Niangara, one labelled "Nov. 20, 1910," the other "1911–1912"; and a third female taken at Faradje "1911–1912."

(36) 14*a*. **Acræa encedon lycia** (Fabricius)

Papilio lycia FABRICIUS, 1775, Syst. Ent., p. 464.
Acræa encedon form *lycia* AURIVILLIUS, 1913, Seitz, Gross-Schmett., XIII, p. 258, Pl. LVI*e*.

One female labelled "Niangara, Nov. 14–16, 1910."

(37) 14*b*. **Acræa encedon fumosa** Aurivillius

Acræa encedon aberration *fumosa* AURIVILLIUS, 1913, Seitz, Gross-Schmett., XIII, p. 258.

One male, Avakubi, November 20, 1909.

(38) 14*c*. **Acræa encedon infuscata** (Staudinger)

Acræa infuscata STAUDINGER, 1885, Exot. Schmett., p. 83.

A male and a female taken at Gamangui in February, and a male taken at Medje in March.

(39) 14*d*. **Acræa encedon alcippina** Aurivillius

Acræa encedon var. *alcippina* AURIVILLIUS, 1898, Rhop. Æthiop., p. 111.

Three females, one caught at Niangara in November, and two at Faradje, "1911–1912."

(40) 15. **Acræa pharsalus** Ward

Acræa pharsalus WARD, 1871, Ent. Mo. Mag., VIII, p. 81. AURIVILLIUS, 1913, Seitz, Gross-Schmett., XIII, p. 258, Pl. LVI*d*.

Eighteen males and four females, mostly taken at Medje in the middle months of the year, but a couple were caught at Gamangui in February and several at Niangara in November.

(41) 16. **Acræa salambo** Grose-Smith

Acræa salambo GROSE-SMITH, 1887, Ann. Mag. Nat. Hist., (5) XIX, p. 62. SMITH AND KIRBY, 1889, Rhop. Exot., I, *Acræa*, Pl. II, figs. 3, 4.

Thirty-two males, mostly taken at Medje in the middle months of the year, although a few were caught at Gamangui in February and some at Avakubi in October.

(42) 17. **Acræa rogersi** Hewitson

Acræa rogersi HEWITSON, 1873, Ent. Mo. Mag., X, p. 57.
Acræa ehmckei DEWITZ, 1889, Ent. Nachr., XV, Pl. I, figs. 6-8.

There are eleven males, the localities and dates of capture being as follows: two, Kwamouth, July 1909; one, Stanleyville, August 1909; one, Lubila, September 1909; one, Gamangui, February 1910; three, Medje, August 1910; three, Niangara, November 1910.

The test of breeding alone can decide whether *salambo* is a mere race or form of this species. In the shape and location of the dark spots they agree very closely. In the coloration of the upper side of the wings *A. rogersi* very nearly resembles *A. egina*, with which, however, it has nothing to do. The resemblance to the latter is purely superficial.

(43) 18. **Acræa althoffi rubrofasciata** Aurivillius

Acræa althoffi DEWITZ, 1889, Ent. Nachr., XV, p. 102, Pl. I, fig. 5.
Acræa althoffi var. *rubrofasciata* AURIVILLIUS, 1895, Ent. Tidskr., XVI, p. 111.

Eight males and one female taken at Medje from July to September, and a male caught at Niangara in November.

(44) 19. **Acræa oberthüri** Butler

Acræa oberthüri BUTLER, 1895, Ann. Mag. Nat. Hist., (6) XVI, p. 271. AURIVILLIUS, 1913, Seitz, Gross-Schmett., XIII, p. 262, Pl. LVIc, *d*.

Seven specimens taken at Medje from May to September.

(45) 19*a*. **Acræa oberthüri confluens** Suffert

Acræa oberthüri confluens SUFFERT, 1904, Iris, XVII, p. 33. AURIVILLIUS, 1913, Seitz, Gross-Schmett., XIII, p. 262.

Three males, one taken in each of the months of May, August, and September at Medje.

(46) 20. **Acræa viviana** Staudinger

Acræa viviana STAUDINGER, 1896, Iris, IX, p. 204. AURIVILLIUS, 1913, Seitz, Gross-Schmett., XIII, p. 262, Pl. LVIc.

Ten males and seven females, mostly from Medje, taken in the middle of the year, but one is recorded as captured at Gamangui in February, and several were caught at Niangara in November.

(47) 21. **Acræa bonasia** (Fabricius)

Papilio bonasia FABRICIUS, 1775, Syst. Ent., p. 464.
Acræa bonasia AURIVILLIUS, 1913, Seitz, Gross-Schmett., XIII, p. 263, Pl. LVI*b*.

Seventy-three specimens taken mostly at Medje and Niangara at the times when collections were made at those places, but there are also others from various scattered localities: Faradje, Lubila, Risimu. This species is one of the most widely diffused and commonest in the forest-lands of central tropical Africa.

(48) 21*a*. **Acræa bonasia supponina** (Staudinger)

Acræa supponina STAUDINGER, 1896, Iris, IX, p. 204. AURIVILLIUS, 1913, Seitz, Gross-Schmett., XIII, p. 264, Pl. LVI*b*.

Of this trifling variety, which has been dignified by a name, there are ten specimens from various scattered localities: Niangara, Faradje, Gamangui, Medje, and Pawa.

(49) 22. **Acræa vinidia** Hewitson

Acræa vinidia Hewitson, 1874, Ent. Mo. Mag., XI, p. 130. Aurivillius, 1913, Seitz, Gross-Schmett., XIII, p. 264, Pl. lvia.

Eighty specimens, representing almost all the localities at which collections were made. Forty-seven were taken at Gamangui in February; thirteen at Medje (June–September); five at Bafwabaka in January; four at Niangara in November; others at Bafwaboli, Batama, Stanleyville, Faradje, Pawa, Kwamouth, and Isangi.

Some of the specimens have dots in the discal area of the fore wings, others do not. Here is an opportunity for a "species-maker" to signalize his acumen by separating the forms and counting the spots, which are variable in number and size. The case might be referred to certain of my friends in Berlin who used, before being otherwise employed, to occupy themselves in making "new species" and advertising them for sale to ardent collectors. When I was younger I often "took the hook," but now, as I look back, I can fancy Dame Nature smiling at the performance.

(50) 23. **Acræa terpsichore** (Linnæus)

Papilio terpsichore Linnæus, 1758, Syst. Nat., 10th Ed., p. 466.
Acræa terpsichore Aurivillius, 1913, Seitz, Gross-Schmett., XIII, p. 264.

There are forty-three males and eleven females in the collection. Of this number twenty-three were taken at Medje or at localities in the forested lands of the western and central parts of the country, Stanleyville, Avakubi, Munie Katoto, Bafwabaka, Kwamouth, Batama, Gamangui. They all conform more or less exactly to the typical form of the western coast in which the subapical black bar is complete, fully enclosing the light subapical spot. Thirty-one were taken at Niangara and Faradje to the northeast in more open country, and show a tendency toward the obliteration of this band, and two specimens from Faradje, a male and a female, are without it, the subapical spot being confluent with the lighter area of the disk, they being therefore referable to the subspecies *buxtoni*, which is the prevalent form on the eastern coast and the grass-lands of the southeastern parts of the continent.

(51) 24. **Acræa pseudegina abadima** (Ribbe)

Acræa abadima Ribbe, 1889, Iris, II, p. 182, Pl. iv, fig. 2.

This insect is represented in the collection by sixteen males and two females. One was taken at Avakubi, three males and a female at Kwamouth, seven males at Medje, five males and a female at Niangara. It was originally described from the Niam-Niam country, but evidently ranges far to the westward. The specimens from Kwamouth tend in the darker coloration of the fore wings in the direction of typical *A. pseudegina.*

(52) 25. **Acræa atergatis** Westwood

Acræa atergatis Westwood, 1881, Oates' Matabeleland, p. 342, Pl. f, figs. 1, 2. Aurivillius, 1913, Seitz, Gross-Schmett., XIII, p. 268, Pl. lv*f*.

A single male caught at Risimu, September 6, 1909.

(53) 26. **Acræa cæcilia** (Fabricius)

Papilio cæcilia Fabricius, 1781, Spec. Ins., II, p. 34.
Acræa cæcilia Aurivillius, 1913, Seitz, Gross-Schmett., XIII, p. 268.

Four males and three females. Three males and two females were caught at Niangara in November; a male and a female at Faradje "1911–1912."

(54) 27. **Acræa acontias** Westwood

Acræa acontias Westwood, 1881, Oates' Matabeleland, p. 343, Pl. f, figs. 7, 8. Aurivillius, 1913, Seitz, Gross-Schmett., XIII, p. 274, Pl. lv*c* (as *atolmis*).

Two males, taken at Kwamouth, July, 1909.

(55) 28. **Acræa cepheus** (Linnæus)

Papilio cepheus Linnæus, 1758, Syst. Nat., 10th Ed., p. 487.
Acræa cepheus Aurivillius, 1913, Seitz, Gross-Schmett., XIII, p. 278, Pl. liv*f*.

Twenty-six males and eleven females, taken principally at Medje, but other localities, as Kwamouth, Bafwaboli, Avakubi, Niangara, and Gamangui are represented. Captures are recorded in February and from June to November.

(56) 29. **Acræa abdera** Hewitson

Acræa abdera Hewitson, 1852, Exot. Butt., I, *Acræa*, Pl. i, figs. 1, 2. Aurivillius, 1913, Seitz, Gross-Schmett., XIII, p. 278, Pl. liv*f*.

Six males and one female, all taken at Niangara in November, except one male, which was caught at Bafwaboli in September.

(57) 30. **Acræa perenna** Doubleday and Hewitson

Acræa perenna Doubleday and Hewitson, 1848, Gen. Diurn. Lep., I, Pl. xix, fig. 4. Aurivillius, 1913, Seitz, Gross-Schmett., XIII, p. 279, Pl. liv*e*.

Seventy-five males and four females, principally from Medje, but most of the other localities mentioned in this paper are also represented; Niangara, Bafwaboli, Gamangui, Boyulu, Lubila, and Avakubi. The sexes are very much alike, the females being a little duller in color than the males, and the fore wings not quite as arcuate.

(58) 31. **Acræa egina** (Cramer)

Papilio egina Cramer, 1775, Pap. Exot., I, p. 64, Pl. xxxiii, figs. *F*, *G*.
Acræa egina Aurivillius, 1913, Seitz, Gross-Schmett., XIII, p. 279, Pl. liv*d*.

Eight males and one female. The female was captured at Gamangui in February. The males were taken at Kwamouth, Avakubi, Munie Katoto, Medje, and Niangara. The dates of capture run from July to November.

(59) 32. **Acræa zetes** (Linnæus)

Papilio zetes Linnæus, 1750, Syst. Nat., 10th Ed., p. 487.
Acræa zetes Aurivillius, 1913, Seitz, Gross-Schmett., XIII, p. 280.

There are six males and two females from various localities. One female was taken at Gamangui in February; three specimens were caught at Medje from July to November; and three at Niangara in November. Typical *A. zetes* (Linnæus) with the fore wings almost solidly black is represented by a male taken at Risimu, September 8, 1909. Such specimens are most often found in material from South Africa. All the other specimens in the present collection belong to the varietal forms *A. menippe* (Drury) and *A. jalema* Godart, which are connected by intergrading forms.

I have in my possession a long series of specimens bred at Kangvé on the Ogové River by the late Dr. A. C. Good. He found the larvæ feeding gregariously, and, as specimens sent me reveal, these insects in no respect differed from each other either in the larval or pupal stages. The brood consisting of males and females, represented every varietal form running from typical *Acræa zetes* (Linnæus) through *Acræa menippe* (Drury) to *Acræa jalema* Godart. The latter, as has been pointed out by Professor Aurivillius, seems to constitute a connecting link between the West African races and the East African form named *Acræa acara* Hewitson. Some of the specimens of *A. jalema* Godart contained in this brood very closely approximate males of *Acræa acara*, of which I have many from Mombasa, with the difference that no specimens from the French Congo show the white squamation in the middle of the hind wing, which is characteristic of all the males of *A. acara*, and the subapical band of the fore wing is invariably narrower than in the East African form. There is, however, a decided difference between the females from the west coast and the east coast. The females of *A. acara*, of which I possess a considerable number, are smaller in size and not as brilliantly colored as the West African females, and the subapical white band of the fore wings is much broader and more diffuse than in the West African form.

(60) 33. **Acræa insignis siginna** Suffert

Acræa insignis siginna Suffert, 1904, Iris, XVII, p. 19. Aurivillius, 1913, Seitz, Gross-Schmett., XIII, p. 284, Pl. liv*a*.

One female, Niangara, November.

(61) 34. **Acræa neobule** Doubleday and Hewitson

Acræa neobule Doubleday and Hewitson, 1848, Gen. Diurn. Lep., I, Pl. xix, fig. 3. Aurivillius, 1913, Seitz, Gross-Schmett., XIII, p. 285, Pl. liii*f*.

Two males, Niangara, November.

(62) 35. **Acræa leucographa** Ribbe

Acræa leucographa Ribbe, 1889, Iris, II, p. 181, Pl. iv, fig. 1. Aurivillius, 1913, Seitz, Gross-Schmett., XIII, p. 285, Pl. liii*e*.

A solitary male, taken at Niangara in November.

Satyridæ

Elymniinæ

ELYMNIOPSIS Fruhstorfer

(63) 1. **Elymniopsis phegea** (Fabricius)

Papilio phegea Fabricius, 1793, Ent. Syst., III, part 1, p. 132.

Elymniopsis phegea Aurivillius, 1911, Seitz, Gross-Schmett., XIII, p. 82, Pl. xxvi*a*.

One male taken at Medje, August 4, and another at Niangara about the beginning of November 1910.

(64) 2. **Elymniopsis bammakoo** (Westwood)

Melanitis bammakoo Westwood, 1851, Gen. Diurn. Lep., II, p. 405, Pl. lxviii, fig. 3.

Elymniopsis bammakoo Aurivillius, 1911, Seitz, Gross-Schmett., XIII, p. 82, Pl. xxvi*a*.

Seven specimens, six males and one female, taken at Medje from August 5 to November 1910.

Satyrinæ

MELANITIS Fabricius

(65) 1. **Melanitis leda africana** (Fruhstorfer)

Melanitis africana Fruhstorfer, 1908, Ent. Zeitschr., XXII, p. 84. Aurivillius 1911, Seitz, Gross-Schmett., XIII, p. 82.

One female taken at Faradje. The only information given by the label is that it was captured in "1911–1912." It belongs to the rainy season form. The separation of this race from typical *M. leda* of India is a rather meticulous refinement.

(66) 2. **Melanitis ansorgei** Rothschild

Melanitis ansorgei Rothschild, 1904, Nov. Zool., XI, p. 451. Aurivillius, 1911, Seitz, Gross-Schmett, XIII, p. 83.

Two males taken at Medje in the first week of September 1910.

Gnophodes Westwood

(67) 1. **Gnophodes parmeno** Doubleday and Hewitson

Gnophodes parmeno Doubleday and Hewitson, 1851, Gen. Diurn. Lep., II, p. 363, Pl. lxi, fig. 2, ♂. Aurivillius, 1911, Seitz, Gross-Schmett., XIII, p. 83, Pl. xxvi*b*.

One damaged male taken at Stanleyville on September 16 and a better preserved female (lacking antennæ) taken at Medje in the early part of September 1910.

(68) 2. **Gnophodes chelys** (Fabricius)

Papilio chelys Fabricius, 1793, Ent. Syst., III, part 1, p. 80.
Gnophodes chelys Aurivillius, 1911, Seitz, Gross-Schmett., XIII, p. 83, Pl. xxvi*c*.

Two males and five females all captured at Medje, the dates ranging from July 19 to the first week of September 1910.

Bicyclus Kirby

(69) 1. **Bicyclus hewitsoni nanodes** (Grose-Smith)

Idiomorphus nanodes Grose-Smith, 1890, Proc. Zool. Soc. London, p. 472.
Mycalesis hewitsoni var. *nanodes* Aurivillius, 1911, Seitz, Gross-Schmett., XIII, p. 84, Pl. xxvi*d*.

Structurally not capable of being separated from *B. hewitsoni* (Doumet) (cf. Rev. Zool., 1861, (2) XIII, p. 175) but on the upper side the submarginal ocelli are more or less obsolete, and the outer pale area of the wings is laved with violaceous. The latter also holds true of many specimens of typical *B. hewitsoni*, which are not all pale brown on this part of the wings. The line of demarcation between the dark basal area of the hind wing and the light outer area is not quite straight as in the typical form but is bent slightly inwardly basad at a point just beyond the end of the cell.

Ten males, all taken at Medje, except one which is recorded as from Faradje, but without any indication of the day or month. The specimens from Medje, with the exception of one taken on April 4, were captured at dates ranging from July 7 to September 24, 1910.

(70) 2. **Bicyclus medontias obsoletus,** new variety

Plate VII, Figure 1, ♂

On the upper side hardly to be distinguished from typical *B. medontias* (Hewitson) (*cf.* Exot. Butt., 1874, *Mycalesis*, Pl. ix, figs. 56, 57), except that the ground-color in both sexes is a little paler. On the under side the median line of both wings is perfectly straight, and not at all curved, as it is in most specimens of *B. medontias* and only half, or even less than half, as wide as it is in the typical form, being reduced to a very narrow, sharp, creamy white line, contrasting strongly against the darker ground-color. All the ocelli are greatly reduced in size, some of them being occasionally obsolete. This may be a wet seasonal form of *B. medontias*.

Types, ♂ and ♀, in The American Museum of Natural History; paratypes in the Holland Collection, Carnegie Muesum.

The collection contains twenty-five males and eight females, all taken at Medje, the dates of capture ranging from July 17 to the middle of September 1910.

(71) 3. **Bicyclus iccius** (Hewitson)

Idiomorphus iccius HEWITSON, 1865, Exot. Butt., III, *Idiomorphus*, Pl. I, figs. 4, 5.
Mycalesis iccius AURIVILLIUS, 1911, Seitz, Gross-Schmett., XIII, p. 85, Pl. XXVI*d*.

Seven males and one female, the latter taken at Medje, July 21, 1910. Of the males three were taken in April, three in August, and one in September.

(72) 4. **Bicyclus sebetus** (Hewitson)

Idiomorphus sebetus HEWITSON, 1877, Exot. Butt., V, Pl. *Mycalesis* and *Idiomorphus*, figs. 6, 7.
Mycalesis sebetus AURIVILLIUS, 1911, Seitz, Gross-Schmett., XIII, p. 85.

Four males and three females taken at Medje, the dates of capture ranging from June 6 to August 6, 1910.

MYCALESIS Hübner

(73) 1. **Mycalesis xeneas** Hewitson

Mycalesis xeneas HEWITSON, 1865, Exot. Butt., III, *Mycalesis*, Pl. VII, fig. 48.
AURIVILLIUS, 1911, Seitz, Gross-Schmett., XIII, p. 86, Pl. XXVII*a*.

The figure given by Hewitson is very poor; that given in Seitz is much better.

The collection contains five males and six females taken at Medje from July 9 to the first week in September and one female taken at Gamangui, June 17, 1910.

(74) 2. **Mycalesis analis** Aurivillius

Mycalesis analis AURIVILLIUS, 1895, Ent. Tidskr., XVI, p. 113, fig. 1; 1911, Seitz, Gross-Schmett., XIII, p. 87.

There are fourteen males and three females, all taken at Medje from July 7 to August 24, 1910.

(75) 3. **Mycalesis tænias** Hewitson

Mycalesis tænias Hewitson, 1877, Exot. Butt., V, Pl. *Mycalesis* and *Idiomorphus*, fig. 66. Aurivillius, 1911, Seitz, Gross-Schmett., XIII, p.87, Pl. xxvii*b*.

Represented by a single male specimen taken at Niangara and belonging to the lot of insects collected at that place between November 26 and December 2, 1910.

(76) 4. **Mycalesis ignobilis** Butler

Mycalesis ignobilis Butler, 1870, Trans. Ent. Soc. London, p. 124; 1871, Lep. Exot., p. 55, Pl. xxi, fig. 4. Aurivillius, 1911, Seitz, Gross-Schmett., XIII, p. 87, Pl. xxvii*b*.

This species, which is quite common in the Ogové valley, is represented in the present collection by five males and a female which were taken at Medje in September 1910.

(77) 5. **Mycalesis asochis** Hewitson

Mycalesis asochis Hewitson, 1865, Exot. Butt., III, *Mycalesis*, Pl. vii, figs. 46, 47. Aurivillius, 1911, Seitz, Gross-Schmett., XIII, p. 88, Pl. xxviic.

Of this not uncommon species there are four males and one female. One male was captured at Gamangui, June 19, two were taken at Medje in July and August, the female was taken at the same place on August 6, and one male is ticketted as from "Niangara, November to December 4, 1910." From this record it appears that the insect must have at least two broods annually.

(78) 6. **Mycalesis sambulos** Hewitson

Mycalesis sambulos Hewitson, 1877, Exot. Butt., V, Pl. *Mycalesis* and *Idiomorphus*, figs. 63, 64. Aurivillius, 1911, Seitz, Gross-Schmett., XIII, p. 89, Pl. xxviic.

There are two males in the collection, both taken at Medje, one on July 12, the other on August 24, 1910.

(79) 7. **Mycalesis mandanes** Hewitson

Mycalesis mandanes Hewitson, 1873, Exot. Butt., V, *Mycalesis*, Pl. ix, figs. 61, 62. Aurivillius, 1911, Seitz, Gross-Schmett., XIII, p. 89, Pl. xxviic.

Professor Aurivillius in his 'Rhopalocera Æthiopica,' p. 53, sank this species as a synonym of *M. auricruda* Butler, but in Seitz, 'Die Gross-Schmetterlinge des Afrikanischen Faunengebietes,' p. 89, he restores it to its rightful place as a distinct species. The outline of the hind wings, which are much more elongate than in *M. auricruda*, is enough, without the many differences in the markings of the under side of the wings, to reveal its distinctness.

Two males taken at Medje in July 1910.

(80) 8. **Mycalesis auricruda** Butler

Mycalesis auricruda Butler, 1868, Cat. Satyr., p. 131, Pl. iii, fig. 6. Aurivillius, 1911, Seitz, Gross-Schmett., XIII, p. 89, Pl. xxviii*c*.

Six males and four females taken at Medje at dates ranging from July 8 to September 6, 1910.

(81) 9. **Mycalesis uniformis** Bethune-Baker (?)

Mycalesis uniformis Bethune-Baker, 1908, Ann. Mag. Nat. Hist., (8) II, p. 470. Aurivillius, 1911, Seitz, Gross-Schmett., XIII., p. 90.

I refer to this species two males and three females before me, which agree better with the description of this species given by Bethune-Baker than with any other known to me. I was at first tempted to describe them as new to science but, after considerable study, have finally decided that they belong here, but cannot be quite positive, as I have not had the opportunity to examine the type of the species, which is a male. The females in the collection agree absolutely with the males in the markings of both the upper and under sides and are only differentiated from them, aside from their sexual characters, by having a greater expanse of wing.

The specimens were taken at Medje, four in August, and one female in September.

(82) 10. **Mycalesis sandace** Hewitson

Mycalesis sandace Hewitson, 1877, Exot. Butt., V, Pl. *Mycalesis* and *Idiomorphus*, fig. 65. Aurivillius, 1911, Seitz, Gross-Schmett., XIII, p. 89, Pl. xxvii*d*.

There is a series of ten males, nine taken at Medje from June 6 to September 20, and one at Gamangui, February 5; and three females, one caught on April 6, the others about the middle of August 1910. None of the specimens are in good condition, all being more or less rubbed and defective.

(83) 11. **Mycalesis miriam** (Fabricius)

Papilio miriam Fabricius, 1793, Ent. Syst., III, part 1, p. 242.
Mycalesis miriam Aurivillius, 1911, Seitz, Gross-Schmett., XIII, p. 90, Pl. xxvii*d*.

One female caught at Medje, September 1910, and nine males and another female taken at Faradje, five labelled as taken in December, the rest ticketted "1911–1912."

(84) 12. **Mycalesis melusina** (Fabricius)

Papilio melusina Fabricius, 1787, Mantissa Ins., II, p. 43.
Mycalesis melusina Aurivillius, 1911, Seitz, Gross-Schmett., XIII, p. 90, Pl. xxvii*d*.

Eleven males and one female caught at Medje, two in April, the rest from July to September 1910.

(85) 13. **Mycalesis sophrosyne** Plœtz

Mycalesis sophrosyne Plœtz, 1880, Stett. Ent. Zeit., XLI, p. 196. Aurivillius, 1911, Seitz, Gross-Schmett., XIII, p. 90.

Three males taken at Medje, one in June, the others in July.

(86) 14. **Mycalesis mollitia** Karsch

Mycalesis mollitia Karsch, 1895, Ent. Nachr., XXI, p. 281. Aurivillius, 1911, Seitz, Gross-Schmett., XIII, p. 90, Pl. xxvii*e*.

Karsch described the male; the female was described by Wichgraf in the Deutsche Entomologische Zeitschrift, 1914, p. 345. It is somewhat larger than the male, paler in color throughout, with the subapical light area of the primaries enlarged and extending along the costa as a light line to a point about opposite the end of the cell. On the under side it does not differ materially in its color and markings from the male.

The collection contains a set of seven males and five females, taken at Medje, one male and three females in April, the rest in July and August.

(87) 15. **Mycalesis obscura** Aurivillius

Mycalesis obscura Aurivillius, 1901, Ent. Tidskr., XXII, p. 114; 1911, Seitz, Gross-Schmett., XIII, p. 91, Pl. xxviii*a*.

I refer to this species a long series of males and several females the general resemblance of which on the under side of the wings to *M. martius* and *M. golo* recalls the remarks of the author of the species, who says that *M. obscura* is very like the two which have been mentioned. There are, however, structural differences which clearly separate this species from *M. martius*. One of these is the absence in *M. obscura* of the tuft of androconia, which is always found in *M. martius* between veins 2 and 3 near the point of their origin on the fore wing, and another is the fact that the hind wing is not produced or angulated at the extremity of vein 4 as is the case in *M. martius*. From *M. golo* they may at once be discriminated by their more uniformly dark color on the under side of the secondaries. The females which I associate with the males have broader wings and are paler in color than the males, but, like the males, strongly recall in the pattern of the markings the corresponding sex of *M. martius*.

Of *M. martius* I have before me, as I write, an enormous series of males and females taken at various localities, ranging from the valley of the Ogové River to Lolodorf in Cameroon and, while superficially the two species are very much alike, so that an untrained investigator might at first glance easily confound the two, the structural differences which I have pointed out enable them to be easily separated. *M. martius* is not represented by a single specimen in the collection upon which I am reporting.

The seventeen males and six females in the collection were all taken at Medje, a couple in April, the rest from July to September.

(88) 16. **Mycalesis dubia** Aurivillius

Mycalesis dubia Aurivillius, 1893, Ent. Tidskr., XIV, p. 270, fig. 4; 1911, Seitz, Gross-Schmett., XIII, p. 92, Pl. xxvii*b*.

There are two males of this species, one taken at Medje in April and another at the same place in September.

(89) 17. **Mycalesis golo** Aurivillius

Mycalesis golo Aurivillius, 1893, Ent. Tidskr., XIV, p. 267, fig. 2.

Mycalesis golo var *violascens* Aurivillius, 1898, Rhop. Æthiop., p. 55; 1911, Seitz, Gross-Schmett., XXIII, p. 91, Pl. xxvii*e*.

Mycalesis golo was originally described by Professor Aurivillius from Cameroon. I have in my possession a large series of specimens from that region, which agree exactly with his description and figure. The series taken by the American Museum Congo Expedition are not typical, but may in part be referred to the varietal form *violascens*, in which the limbal area of the wings is more or less suffused with violet and the transverse line of the hind wing is obscured by the outward extension of the dark color of the basal and discal area of the wing. Some of the specimens taken at Medje approach more nearly to the typical form but these differ, nevertheless, by having the upper surface of the wings distinctly brown and not dark blackish brown like the insect from Cameroon. This difference, while it holds good of all the specimens not referable to the variety *violascens*, hardly seems to me to be of sufficient importance to justify the erection of a subspecies.

Of *M. golo violascens* there are in the collection seventeen males, one taken at Niangara in November, the rest caught at Medje from July to September. Of the reddish form there are eight males taken at Medje in August and September.

(90) 18. **Mycalesis baumanni** Karsch (?)

Mycalesis baumanni Karsch, 1894, Ent. Nachr., XX, p. 230. Aurivillius, 1911, Seitz, Gross-Schmett., p. 91, Pl. xxvii*e*.

With a good deal of hesitation I refer to this species five males which are before me. They belong to the Fourth Subgroup of the classification proposed by Professor Aurivillius (cf. Seitz, 'Die Gross-Schmetterlinge des Afrikanischen Faunengebietes,' p. 91), but they differ from *M. baumanni* in not having the transverse bands on the under side of the fore and hind wings strongly produced on vein 4. This band has its outer margin more or less irregular, and its course recalls that of the band on the under side of *M. sandace* Hewitson, with which the specimens otherwise have nothing to do, as is shown by the sexual brands and the entire absence of ocelli on the upper side of the primaries.

The specimens are not, for the most part, very well preserved, some of them being rather badly rubbed, making the determination of the exact pattern of the markings a little difficult to determine, but I do not feel like hazarding their description as a new species, though eventually they may turn out to be undescribed.

The specimens were taken at Medje, one in April, the others at dates ranging from July to September.

(91) 19. **Mycalesis milyas** Hewitson (?)

Mycalesis milyas Hewitson, 1864, Exot. Butt., III, *Mycalesis*, Pl. vi, fig. 34. Aurivillius, 1911, Seitz, Gross-Schmett., XIII, p. 92, Pl. xxvii*g*.

I refer with great doubt a rubbed male and a rather poorly preserved female to this species. The male was taken at Medje in September 1910, the female in July.

The description and figure of *M. milyas* given by Hewitson (*loc. cit.*) leave much to be desired. The figure given by Aurivillius on Plate xxvii of 'Die Gross-Schmetterlinge des Afrikanischen Faunengebietes' more nearly represents the under side of the specimens under consideration, but his description does not agree either with the figure he gives or the specimens before me. I have in my possession a male taken at Efulen by A. C. Good, and there are in the Carnegie Museum some specimens taken by A. C. Good at Lolodorf, which are identical with the insect taken at Medje. I have assigned all of them to *M. milyas* with a double interrogation mark, as they do not perfectly agree either with the descriptions or figures hitherto given by authors, although they come nearer to that species than to any other.

(92) 20. **Mycalesis pavonis** Butler

Mycalesis pavonis Butler, 1876, Ann. Mag. Nat. Hist., (4) XVIII, p. 481. Aurivillius, 1911, Seitz, Gross-Schmett., XIII, p. 92.

There are seven males and three females of this well-marked species, all taken at Faradje in November and December.

(93) 21. **Mycalesis desolata** Butler

Mycalesis desolata Butler, 1876, Ann. Mag. Nat. Hist., (4) XVIII, p. 480.
Mycalesis leptoglena Karsch, 1893, Berl. Ent. Zeit., XXXVIII, p. 208, Pl. v, fig. 7.
Mycalesis desolata Aurivillius, 1911, Seitz, Gross-Schmett., XIII, p. 93.

Of this species there are five males, four of which agree absolutely with the published descriptions and figure, but the fifth has the submarginal ocelli much larger, with round black centers pupilled with white, contrasting with the dull ground-color of the wings in a very striking manner. In the typical form the ocelli are more or less obsolete. The specimens were all taken at Niangara in November.

(94) 22. **Mycalesis safitza æthiops** Rothschild and Jordan

Mycalesis safitza æthiops Rothschild and Jordan, 1905, Nov. Zool.,XII, p. 175.

M. safitza was described and figured by Hewitson (cf. Gen. Diurn. Lep., 1851, II, p. 394, note, Pl. lxvi, fig. 3). Of the form *æthiops* there are fifteen males and two females, all of which were taken at Faradje and Niangara in November and December. There are also two males and seven females taken at Medje in the months of July and August, which are so much like the others in their markings that it is impossible to separate them, though they are somewhat larger in size.

(95) 22*a*. **Mycalesis safitza evenus** (Hopffer)

Mycalesis evenus Hopffer, 1855, Monatsber. Akad. Wiss. Berlin, p. 641; 1862, Peters, Reise n. Mossambique, Ins. ,p 394, Pl. xxv, figs. 5, 6. Aurivillius, 1911, Seitz, Gross-Schmett., p. 93, Pl. xxviie.

Of this, the dry-season form of *M. safitza*, there are two males and two females. One of the males was taken at Medje in August, the other at Faradje in November. Both of the females were captured at Niangara in November.

(96) 23. **Mycalesis langi,** new species

Plate X, Figure 10, ♂

♂. The fore wing with a small, but distinct, sexual brand at the middle of vein 1, which at this point is slightly bent costad. The hind wing with a pale yellowish brown pencil of hairs on the upper margin of the cell about the middle and beyond it with a black tuft of hairs on the sixth interspace. The upper side of both wings is totally devoid of all ocelli. The prevalent color is mouse-gray, the discal area of the fore wings being black and velvety, this black area covering the end of the cell and the origin of the submedian nervules, extending to the inner margin from near the outer angle to within one-third of the distance from the base. The hind wings also are black, or very dark brown, except on the outer and inner margins. Both wings have a very fine black marginal line, paralleled inwardly by a similar fine submarginal line, separated from the outer line by a space less than half a millimeter in diameter.

The fringes are obscurely checkered at the ends of the nervules by darker scales, contrasting with the pale mouse-gray color of the rest of the fringes. On the under side the markings recall those of *M. safitza*, but the ground-color is darker. Expanse, 37 mm. (The expanse of the smallest specimen of *M. safitza* before the writer—there are many scores of them—is 45 mm.)

Type from Medje; paratypes, from Faradje. Type and two paratypes in The American Museum of Natural History, New York; two paratypes in the Holland Collection in the Carnegie Museum.

This may prove to be a local or seasonal form of *M. safitza*, but it differs so markedly from all the varieties of that species known to the writer that he does not hesitate to describe it as new. The entire absence of any trace of ocelli on the upper side of the wings, the black velvety color of the central area of the fore wings, the checkered fringes, and the uniformly small size of the specimens, all indicate that we are dealing with what is at all events a marked variety, separable at a glance from *M. safitza* and all the varieties of that species hitherto described.

I have the honor of naming the species after Mr. Herbert Lang, the capable head of the Expedition, to whose enthusiasm we are indebted for the large entomological collections which were returned.

(97) 24. **Mycalesis chapini,** new species

Plate VII, Figure 9, ♂

♂. On the upper side having a general resemblance to the male of *M. langi* Holland, but considerably larger in size, and having the fringes of the wings more decidedly checkered with dark at the ends of the nervules. On the under side wholly different from *M. langi* and in the disposition of the markings, but not their color, recalling the under side of *M. baumanni* Karsch. The ground-color of the under side is pale sienna sprinkled with minute dark transverse lines and dots, the basal half of both wings and the limbal area of the primaries near the outer angle broadly clouded with purplish brown. A sub-basal and median transverse line, curving outwardly from the costa of the fore wing to the inner margin of the hind wing about its middle, run approximately parallel to each other. The median line is produced somewhat sharply at the origin of vein 4 on each wing, and is more or less waved on the interspaces, the curves bending outwardly. The space between the sub-basal and median lines is a trifle darker than the rest of the wings, partly due to the increase in this field of the minute strigulæ with which the wings are strewn. The ocelli are, for the most part, entirely obsolete, at most being represented by minute white dots, except the two nearest the anal angle of the secondaries, which in the type are exceedingly minute black circles, under the glass seen to be pupilled with white and ringed about with pale ochreous. Expanse, 42 mm.

Niangara. Type unique, in The American Museum of Natural History.

This insect is so totally unlike any other in the group to which it belongs that I do not hesitate to describe it as new. I take pleasure in naming it in honor of Mr. J. P. Chapin, one of the leaders of the Expedition.

(98) 25. **Mycalesis vulgaris** Butler

Mycalesis vulgaris Butler, 1868, Cat. Satyr., p. 130, Pl. III, fig. 8. Aurivillius, 1911, Seitz, Gross-Schmett., XIII, p. 95, Pl. XXVII*g*.

A single male taken at Niangara, November 26, 1910.

(99) 25*a*. **Mycalesis vulgaris tolosa** (Plœtz)

Mycalesis tolosa Plœtz, 1880, Stett. Ent. Zeit., XLI, p. 197.

This is the dry-season form of this species, and is characterized by having the ocelli well developed and not reduced to mere points, as is the case in typical *M. vulgaris*. It is the prevailing form in the region of the Ogové River, in Cameroon, and in the Belgian Congo. In spite of its name, typical *M. vulgaris* is not very common in collections, so far as my observations show.

Of the variety *tolosa* (Ploetz) the collection upon which I am reporting contains three males and eight females. One female was taken at Medje in July, one at Lubila in September, three at Niangara in November, and three at Faradje in December. One of the males was caught at Niangara in November, and the other two at Faradje in December.

(100) 26. **Mycalesis nebulosa** Felder

Mycalesis nebulosa Felder, 1867, Reise Novara, Lep., III, p. 502. Aurivillius, 1911, Seitz, Gross-Schmett., XIII, p. 95, Pl. XXVII*f*.

There are two poorly preserved males and one female of this species, which were taken at Niangara in November.

(101) 27. **Mycalesis agraphis** Karsch

Mycalesis agraphis Karsch, 1893, Berl. Ent. Zeit., XXXVIII, p. 207. Aurivillius, 1911, Seitz, Gross-Schmett., XIII, p. 96, Pl. XXVII*f*.

A single male of this common West African species caught at Avakubi in November.

HENOTESIA Butler

(102) 1. **Henotesia perspicua** (Trimen)

Mycalesis perspicua Trimen, 1873, Trans. Ent. Soc. London, p. 104, Pl. I, fig. 3.
Henotesia perspicua Aurivillius, 1911, Seitz, Gross-Schmett., XIII, p. 97, Pl. XXVIII*a*.

Five males: one was taken at Risimu in September; two at Niangara in November; and two at Faradje, one in December, the other without date.

(103) 2. **Henotesia phæa** (Karsch)

Mycalesis phæa Karsch, 1894, Ent. Nachr., XX, p. 232.
Henotesia phæa Aurivillius, 1911, Seitz, Gross-Schmett., p. 98, Pl. XXVIII*b*.

Four males taken at Faradje, one on December 12, 1912, the other three ticketted "1911–1912."

(104) 3. **Henotesia eliasis** (Hewitson)

Mycalesis eliasis Hewitson, 1866, Exot. Butt., III, *Mycalesis*, Pl. vii, figs. 44, 45.
Henotesia eliasis Aurivillius, 1911, Seitz, Gross-Schmett., XIII, p. 99, Pl. xxviii*d*.

A single damaged male labelled "Kwamouth, July 14, 1909."

(105) 4. **Henotesia peitho** (Plœtz)

Mycalesis peitho Plœtz, 1880, Stett. Ent. Zeit., XLI, p. 197.
Henotesia peitho Aurivillius, 1911, Seitz, Gross-Schmett., XIII, p. 99, Pl. xxviii*a*.

Four males taken at Medje, one in April, two in August, and one in September.

Ypthima Hübner

(106) 1. **Ypthima asterope** (Klug)

Hipparchia asterope Klug, 1832, Symb. Phys., Pl. xxix, figs. 11–14.
Ypthima asterope Aurivillius, 1911, Seitz, Gross-Schmett., XIII, p. 115, Pl. xxix*c*.

One male taken at Niangara, November 25, 1910.

(107) 2. **Ypthima simplicia** Butler

Ypthima simplicia Butler, 1876, Ann. Mag. Nat. Hist., (4) XVIII, p. 481. Aurivillius, 1911, Seitz, Gross-Schmett., XIII, p. 115.

A poorly preserved male caught at Faradje and labelled "1911–1912."

(108) 3. **Ypthima doleta** Kirby

Ypthima doleta Kirby, 1880, Proc. Roy. Dublin Soc., (2) II, p. 336. Aurivillius, 1911, Seitz, Gross-Schmett., XIII, p. 115, Pl. xxix*c*.

Of the fourteen males one is labelled as from Bafwasende, September 23, 1910; all the rest were taken at Medje, two in April, the rest from July to September. Of the two females one was caught at Medje in August, the other at Niangara in November.

(109) 4. **Ypthima itonia** Hewitson

Ypthima itonia Hewitson, 1864, Trans. Ent. Soc. London, p. 287, Pl. xviii, fig. 13. Aurivillius, 1911, Seitz, Gross-Schmett., XIII, p. 116.

Six males taken at Faradje in November.

Nymphalidæ

Argynnidinæ

Lachnoptera Doubleday

(110) 1. **Lachnoptera iole** (Fabricius)

Papilio iole Fabricius, 1781, Spec. Ins., II, p. 78.
Lachnoptera iole Aurivillius, 1913, Seitz, Gross-Schmett., XIII, p. 230, Pl. lii*f*.

This species is represented in the collection by twelve males and one female of the dimorphic form named *L. hecatæa* by Hewitson. All of the specimens are from Medje (June-September) except one male specimen captured at Gamangui in June.

ATELLA Doubleday

(111) 1. **Atella columbina** (Cramer)

Papilio columbina CRAMER, 1779, Pap. Exot., III, p. 76, Pl. CCXXXVIII, figs. *A*, *B*.
Atella columbina AURIVILLIUS, 1913, Seitz, Gross-Schmett., XIII, p. 230, Pl. LII*f*.

Twenty-six specimens; six taken at Gamangui in February; one at Lubila in September 1909; eight at Niangara in November; and the rest at Medje, one in April, the others from July to September 1910.

(112) 2. **Atella phalantha æthiopica** Rothschild and Jordan

Atella phalantha form *æthiopica* ROTHSCHILD AND JORDAN, 1903, Nov. Zool., X, p. 505.

Twenty-eight specimens, two of which were taken at Medje in July, the rest at Niangara in November. The species was originally described from the East Indies, and is figured by Drury (1773, Ill. Exot. Ent., I, p. 41, Pl. XXI, figs. 1, 2). Its range covers the tropical regions of the Eastern Hemisphere and it is one of the most widely distributed insects of the Old World. The separation of the race found in Africa from the oriental varieties is a recent refinement in classification which is justifiable, although founded on differences which are recognizable, but very slight.

Vanessinæ

ANTANARTIA Rothschild and Jordan

(113) 1. **Antanartia delius** (Drury)

Papilio delius DRURY, 1782, Ill. Exot. Ent., III, p. 18, Pl. XIV, figs. 5, 6.
Hypanartia delius AURIVILLIUS, 1898, Rhop. Æthiop., p. 130.
Antanartia delius ROTHSCHILD AND JORDAN, 1903, Nov. Zool., X, p. 508. AURIVILLIUS, 1913, Seitz, Gross-Schmett., XIII, p. 229, Pl. LII*c*.

Fifty-three specimens, mostly males, principally taken at Medje from June to September, but there are a couple caught at Niangara in November and one captured at Munie Katoto in September.

PYRAMEIS Hübner

(114) 1. **Pyrameis cardui** (Linnæus)

Papilio cardui LINNÆUS, 1758, Syst. Nat., 10th Ed., p. 475.
Pyrameis cardui AURIVILLIUS, 1913, Seitz, Gross-Schmett., XIII, p. 227.

This cosmopolitan species is represented in the collection by three examples, two taken at Niangara, and one at Faradje, "1911–1912." It is worthy of note that no specimens were taken at Medje or other localities in the hot, humid tropical forest-lands. The insect does not appear to turn up in the dense jungle of the hottest parts of Africa, but seems to be confined to the more open lands, where thistles grow. In the more than forty years in which I have been receiving collections from tropical Africa I never have obtained specimens of "The Painted Lady" from such places as the Ogové Valley, or the swampy palm-clad savannas along the big rivers; but, on the other hand, it has often been received from the sandy coastal ridges, and the higher grass-lands of both the western, the eastern, and the southern parts of the continent.

Vanessula Dewitz

(115) 1. **Vanessula milca** (Hewitson)

Liptena milca Hewitson, 1873, Exot. Butt., V, *Pentila* and *Liptena*, Pl. ii, fig. 17.
Vanessula milca Aurivillius, 1913, Seitz, Gross-Schmett., XIII, p. 227, Pl. lii*e*.

Nine specimens captured at Medje from July to September. This pretty little insect is very common in the valley of the Ogové, and apparently swarms in southern Cameroon.

Junonia Hübner

I deem it more natural to associate under the term *Junonia* a number of species which for many years past have been placed in this genus, but which Dr. Aurivillius in his recent writings has incorporated into the genus *Precis*.

(116) 1. **Junonia orithya madagascariensis** Guenée

Junonia orithya var. *madagascariensis* Guenée, 1865, Vinson's Voy. Madgr., Lep., p. 37.
Precis orithya Aurivillius, 1913, Seitz, Gross-Schmett., XIII, p. 226.

This is the African form of the insect originally named from the East Indies by Linnæus (cf. Mus. Ulr., 1764, p. 278). The collection contains thirteen males and one female, all taken at Faradje and Niangara in November 1910, or else labelled "1911-1912."

(117) 2. **Junonia clelia** (Cramer)

Papilio clelia Cramer, 1775, Pap. Exot., I, p. 23, Pl. xxi, figs. *E*, *F*.
Precis clelia Aurivillius, 1913, Seitz, Gross-Schmett., XIII, p. 226, Pl. li*a*.

Twenty-three males and fifteen females were taken. Two males and one female were caught at Kwamouth in July 1909. Two males and one female were captured at Pawa, October 1910. Eight males and four females are labelled as taken at Medje from April to August 1910. Eleven males and nine females were caught at Niangara in November of the latter year.

(118) 3. **Junonia cebrene** Trimen

Junonia cebrene TRIMEN, 1870, Trans. Ent. Soc. London, p. 353.
Precis cebrene AURIVILLIUS, 1913, Seitz, Gross-Schmett., XIII, p. 226, Pl. LI*a*.

This is the African race of *J. œnone* (Linnæus) originally described from Asiatic specimens, which do not materially differ from the African form, except that in the latter the large yellow area of the primaries is somewhat more restricted, and the blue spot on the hind wing is rounder, and not oval as in the Asiatic specimens, a long suite of which is before me as I write. Eighteen males, six females, all captured at Niangara and Faradje in November 1910.

(119) 4. **Junonia westermanni** Westwood

Junonia westermanni WESTWOOD, 1870, Ent. Mo. Mag., VI, p. 278; 1874, Thes. Ent. Oxon., p. 182, Pl. XXXIV, fig. 7, ♂, fig. 8, ♀.
Precis westermanni AURIVILLIUS, 1913, Seitz, Gross-Schmett., XIII, p. 225, Pl. LI*a*.

Of this lovely insect fifty-three males and one female are contained in the collection. Most of them were caught at Medje, the dates of capture ranging from April to August. There are two males taken at Gamangui in February and two others taken at the same place in June. There is one male captured at Ngayu in April. The extreme rarity of the female in collections is illustrated in the present case.

(120) 5. **Junonia sophia** (Fabricius)

Papilio sophia FABRICIUS, 1793, Ent. Syst., III, part 1, p. 248.
Precis sophia AURIVILLIUS, 1913, Seitz, Gross-Schmett., XIII, p. 225, Pl. LI*b*.

Though very dissimilar in its style of markings from most species of the genus, *sophia* is a true *Junonia*, as is shown by the neuration, the outline of the wings, and the structure of the antennæ and palpi. Of this insect, the smallest of the genus, which superficially on the upper side bears a likeness to the female of the preceding species, there are nine males and five females. One male and the five females were taken at Medje, from June to August 1910. Seven males are ticketted as taken at Niangara and Faradje in November 1910, or else "1911–1912."

PRECIS Hübner

Dr. Aurivillius in his latest account of the butterflies belonging to this group (cf. Seitz, 'Gross-Schmetterlinge der Erde,' XIII, pp. 218–227), has placed in the genus *Precis* a number of forms which for many years past have been by most writers classified in the genus *Junonia* Hübner. The type of the genus *Precis* is *P. octavia* (Cramer). The type of the genus *Junonia* is *J. lavinia* (Cramer). It requires no effort to detect the fact that the species included by Aurivillius in his "Fifth Group" of the genus *Precis*, except *P. octavia* and allies, viz., *clelia* (Cramer), *orithya* (Linnæus), *westermanni* Westwood, and their allies are in structure, form, and markings more nearly related to *J. lavinia* than to *P. octavia*, the type of the genus, and that they are widely different from the *Kallima*-like insects which, especially in their wet-season forms, show on the under side of their wings close resemblance to dried leaves.

In the present paper I have restored the species of the *clelia-œnone* Group to the genus *Junonia*. I also separate from the genus *Precis* the long-tailed *Kallima*-like insects, which on the under side of the wings show mimetic resemblance to dried leaves, and in which the outer border of the hind wing is evenly curved opposite the end of the cell, not angulated or toothed, and greatly elongated, or tailed at the anal angle. For this group of insects I propose the generic name **Kallimula.**

As restricted in the present paper, the genus *Precis* may be divided into groups as follows.

A. Hind wings greatly expanded opposite end of cell, not greatly produced at anal angle.
    1. Outer margin of hind wing crenulated: *P. octavia* (type of genus) and allies; *P. archesia* and allies.
    2. Outer margin of hind wings entire, evenly rounded, not crenulated: *P. artaxia* and allies.

B. Hind wings angulated and toothed opposite the end of the cell.
    1. Anal angle not greatly produced: *P. chorimene* and allies; *P. terea* and allies; *P. ceryne* and allies; *P. rhadama* and varieties.
    2. Anal angle greatly produced: *P. andremiaja* and allies.

(121) 1. **Precis octavia** (Cramer)

Papilio octavia Cramer, 1777, Pap. Exot., II, p. 60, Pl. cxxxv, figs. *B*, *C*.
Precis octavia Aurivillius, 1913, Seitz, Gross-Schmett., XIII, p. 224, Pl. lib.

Thirty-six males and thirty-five females. One male was caught at Kwamouth, July 14, 1909; three females were taken at Medje in August; and all the rest were obtained at Niangara in November 1910, except a solitary individual, which is labelled as caught at Faradje in the same month and year.

This is the rainy-season form of the species in the northwestern part of the range, and the capture of these specimens shows that the region about the headwaters of the Uelle River in the Niam-niam country is faunistically allied to the country of the upper waters of the Niger.

(122) 1*a*. **Precis octavia amestris** (Drury)[1]

Papilio amestris Drury, 1782, Ill. Exot. Ent., III, p. 26, Pl. xx, figs. 3, 4.
Precis amestris Aurivillius, 1913, Seitz, Gross-Schmett., XIII, p. 224.

There are twenty males and eleven females of this, the dry-season form of *P. octavia*. They were all taken at Niangara in November 1910, except two of the males, which were caught at Medje in August.

In the southern and eastern parts of the range of this insect *amestris* is replaced by the form *sesamus* Trimen, the upper side of the wings of which are much bluer than in this form, and do not have the red spots in the cell of the fore wings, which are always found in the form under consideration. We have specimens of *P. octavia sesamus* from Natal and Mozambique.

(123) 2. **Precis chorimene** (Guérin)

Vanessa chorimene Guérin, 1844, Icon. Règne Anim., Ins., p. 476.
Salamis ethyra Feisthamel, 1850, Ann. Soc. Ent. France, (2) VIII, p. 250.
Precis chorimene Aurivillius, 1913, Seitz, Gross-Schmett., XIII, p. 220, Pl. lii*b*.

Four males and two females. One male was taken at Faradje, "1911–1912"; three at Niangara in November 1910; one female was caught at Pawa, October 19, the other at Niangara on November 25, 1910.

(124) 3. **Precis stygia** Aurivillius

Precis ethyra Staudinger, 1883, Exot. Schmett., I, p. 102, Pl. xxxviii (*non ethyra* Feisthamel = *chorimene* Guérin).
Precis stygia Aurivillius, 1894, Ent. Tidskr., XV, p. 275; 1898, Rhop. Æthiop., p. 142; 1913, Seitz, Gross-Schmett., XIII, p. 220, Pl. lii*b*.

This species is represented in the collection by eighty-seven specimens. We have several hundreds of other specimens in the Carnegie Museum. It evidently is common where it occurs. The female differs from the male in being lighter in color and broader of wing. The females vary in their markings like the males, of which there are three varieties: *P. stygia stygia* Aurivillius, the typical form; *P. stygia gregorii* Butler; and a third, which I believe has not hitherto been described or figured, and to which I apply the name of **P. stygia fuscata**, new variety.

---

[1] *P. simia* Wallengren and *P. trimeni* are near allies of *P. octavia* (Cram.) and differ from *P. antilope* (Feisthamel). The latter species appears to me to be represented by Aurivillius (Seitz, Gross-Schmett., XIII, Pl. lic) by a female of *P. trimeni*, to which there is a superficial resemblance upon the upper side, but which differs greatly from *P. antilope* on the lower side of the wings. I am strongly inclined to think that an unintentional error was committed by the author of the plate to which I make reference. *P. antilope* (Feisthamel) falls into the group which I designate as *Kallimula*.

(125) 3*a*. **Precis stygia stygia** Aurivillius (typical)
Plate VII, Figure 3, ♀

Accepting the figure given by Aurivillius in Seitz, XIII, Pl. VII*b*, as adequately representing the species, and comparing it with his description of the same, it is plain that this form is characterized by the presence of light areas on the under side of the wing, particularly at the apex and outer margin of the primaries and around the outer border of the secondaries. It is also larger in size than the other two forms, though this difference is not so marked in some specimens of *P. stygia gregorii*, many of which approximate *P. stygia stygia* in size.

This is no doubt a dry-season form. Niangara, Medje, and Munie Katoto.

(126) 3*b*. **Precis stygia gregorii** (Butler)
Plate VII, Figure 4, ♂

Precis gregorii BUTLER, 1895, Proc. Zool. Soc. London, p. 726, Pl. XLII, figs. 7, 8.

This form may or may not be marked at the apex of the fore wing and on the outer margin of both wings with the light maculation which characterizes typical *P. stygia*, but it is invariably discriminated from the former and from the third form by the presence in the male of at least one brilliantly white or very light yellow spot on the costa of the secondaries on the lower side, which spot is exactly at the termination of the dark band which in all the three forms runs from the anal angle to about the outer fourth of the upper margin of the wing. In the females this same spot also occurs, but it is frequently accompanied by one or more similar spots on the interspaces lower down on the wing, which spots usually are situated either in the middle of the dark medial band, or slightly beyond it toward the outer border.

This is probably, like the preceding, a dry-season form. Niangara and Medje.

(127) 3*c*. **Precis stygia fuscata,** new variety
Plate VII, Figure 5, ♂

This form, which is by far the commonest of the three, is, on the average, appreciably smaller in expanse of wing than the two preceding, lacks almost altogether any light cloudings or spots or marks on the under side of the wings, the only traces of such being the almost microscopic dots which indicate the location of the vanished ocelli, which are more or less visible on the outer third of the wings of *P. stygia stygia* and *P. stygia gregorii*. The prevalent color of the lower side of the wings is brown marked with darker brown or black spots, the most prominent of all these being the transverse band on the secondaries.

This is the wet-season form and is the commonest one on the western coast. The type locality is Medje; also at Munie Katoto.

That the distinction between these forms may be clear I have given figures of them on Plate VII. The females, so far as I can ascertain, have never before been depicted.

Of *P. stygia stygia*, the collection contains six males taken at Niangara in November; two males and one female caught at Medje in July and August; and one female captured at Bafwaboli, September 10, 1909. Of *P. stygia gregorii*, there are eight males caught at Medje, one in April, the rest in July and August; and two males taken at Niangara in November 1910. Of *P. stygia fuscata*, there are sixty-one males and six females, all taken at Medje, except one male captured at Bafwaboli, September 10, 1909; those taken at Medje were caught in July and August, except a few taken in April.

(128) 4. **Precis terea** (Drury)

Papilio terea Drury, 1773, Ill. Exot. Ent., II, p. 32, Pl. xviii, figs. 3, 4.
Precis terea Aurivillius, 1913, Seitz, Gross-Schmett., XIII, p. 220, Pl. li*f*.

The collection contains seventy-two males and twenty females of this species. Two of the females were taken at Leopoldville, two at Medje, and sixteen at Niangara. One male was taken at Bafwaboli, September 1909, and eleven at Medje, June to August 1910. The remaining sixty males were taken mostly at Niangara, in November 1910, though a few specimens are labelled as taken at Faradje, in the same month and year, and one or two at Medje. The females are somewhat greater in expanse of wing and lighter in color than the males, but there is no great variation between the sexes.

(129) 5. **Precis ceryne** (Boisduval)

Salamis ceryne Boisduval, 1847, Delegorgue, Voy. Afr. Australe, II, p. 592.
Junonia ceryne Trimen, 1862, Rhop. Afr. Austr., I, p. 131; 1866, II, Pl. iii, fig. 4.
Precis ceryne Aurivillius, 1913, Seitz, Gross-Schmett., XIII, p. 223, Pl. li*d*.

Four males taken at Faradje and labelled "1911–1912." They are all of the wet-season form of the species.

KALLIMULA, new genus

Allied to *Precis* Hübner and *Junonia* Hübner, but differing in having the fore wings strongly falcate at the apex and deeply excavated on the outer margin below vein 6; the hind wings either strongly produced or evenly rounded opposite the end of the cell, the margins more or less entire and strongly produced, or tailed, at the anal angle; both wings crossed near the middle by light bands, generally some shade of red, pink, or ochreous, though in one form (*K. harpyia*) these bands are shot with blue over the red.

Type, *Kallimula osborni*, new species.

In separating from the genus *Precis*, as constituted by Aurivillius, the *Kallima*-like forms which he has brought together in part in his fourth group, I think I am not doing violence, in spite of the fact that in my arrangement I am compelled to introduce as one of the members of this group the species named *pelarga*, which in its dry-season form shows a resemblance to the species which I have included under *Precis*. However, *K. pelarga*, in its dry-season form, always has the hind wings more or less elongated at the anal angle and thus may be discriminated from *Precis octavia* and its allies, which do not have the anal angle greatly produced. *K. pelarga* marks the transition between the genus *Precis* and the genus *Kallimula*.

The species which I refer to the new genus are the following: *K. osborni*, new species; *eurodoce* (Westwood); *milonia* (Felder); *sinuata* (Plœtz); *cælestina* (Dewitz); *actia* (Distant); *antilope* (Feisthamel); *antilope*, var. *cuama* (Hewitson); *pelarga* (Fabricius); *pelarga*, var. *leodice* (Cramer); *pelarga*, var. *harpyia* (Fabricius).

(130) 1. **Kallimula osborni,** new species

Plate VII: Figure 7, ♂; Figure 8, ♀

♂. Palpi black above, brilliantly white below. Upper side of head, thorax, and abdomen black. Pectus white, like the lower side of the palpi. Legs pale yellowish, dorsally shaded with fuscous. Lower side of abdomen pale fulvous. Fore wings with costa strongly arcuate; outer margin at apex very falcate, strongly produced at the end of vain 6; deeply excised below this and then gently rounded to the lower angle. The hind margin of the fore wing is nearly straight. Hind wings with the costal margin gently (flatly) curved from the base to the upper angle; the outer margin regularly curved outwardly to a point opposite the lower angle of the cell and then inwardly toward the anal angle, the curve running to the tip of the long tail-like projection of the anal angle. On the inner margin the hind wings are strongly curved inwardly from the abdomen until a little after the middle, and then the curve is reversed to the tip of the anal projection. The wings are very dark brown on the upper side interrupted on the discal area with a bright rufous mesial band. This band on the primaries is widest at the inner margin, and sweeps upward toward the costa terminating near the origin of vein 6, being externally delimited by an almost regular curve, running from the inner margin from a point about three millimeters behind the outer angle to the origin of vein 6; internally the band is more irregular, being deeply invaded by an outward projection of the dark basal tract on interspace 4. The band has the outline of an inverted cornucopia. There is a sharply defined, small, white spot not far from the apex between veins 5 and 6; and three black spots in the transverse rufous band, one on each of the interspaces 2, 3, and 4, nearer the outer than the inner margin of the band. The transverse band of the hind wing is continuous with the band on the fore wing, narrower at the costa than on the inner margin. It is evenly curved externally, except on interspaces 6 and 7, where the dark outer border invades it by step-like inner projections. The outer band is wider on the secondaries than on the primaries. The inner margin of the light band is somewhat irregular, where it crosses the middle of the cell, being invaded by a sharp tooth-like projection of the dark basal area of the wing. There is a regular curved series of black circular spots beginning between veins 2 and 3 and running upward to the costa, the spots gradually increasing in size toward the costa, and being located nearer the outer margin of the band than its inner margin. On the lower side of the wings there is a dark narrow line of deep brown or black which runs from the tip of the tail-like projection of the anal angle of the hind wing to about the middle of the costa of the fore wing, simulating the appearance of the mid-rib of a leaf. On either side of this central transverse line the wings are more or less rufous, irregularly mottled with darker brown, and being heavily clouded with dark brown at the apex of the primaries and the anal angle of the secondaries. The fore wings near the apex and the hind wings near the anal angle are marked with lighter marginal and submarginal narrow lines and more or less frosted with light-colored scales. The series of spots which are conspicuous on the upper side reappear on the lower side in the interspaces, but on the lower side are pupilled with white, in most, but not in all cases.

♀. The female is not unlike the male, but the wings are broader, and at the apex of the primaries not so strongly falcate, and the transverse band of the secondaries is more or less creamy white, especially toward the anal angle. Expanse, ♂, 45–50 mm.; ♀, 50–55 mm.

The male type (Medje) is in The American Museum of Natural History, the female allotype (Cameroon) is in the Holland Collection in the Carnegie Museum.

Four males were taken by the Lang-Chapin Expedition at Medje, the dates of capture ranging from July to September.

I have long had this species in my collection, where it is represented by specimens collected for me many years ago in southern Cameroon by the late Dr. A. C. Good. I take pleasure in naming it in honor of my friend, Prof. Henry Fairfield Osborn of The American Museum of Natural History, with whom I have spent many pleasant hours both at home and abroad in the pursuit of pleasure and knowledge.

(131) 2. **Kallimula milonia** (Felder)

Precis milonia Felder, 1867, Reise Novara, Lep., III p. 403. Aurivillius, 1913, Seitz, Gross-Schmett., XIII, p. 223.

Precis kowara Ward, 1871, Ent. Mo. Mag., VIII, p. 22; 1873, Afr. Lep., p. 6, Pl. v, figs. 5, 6.

The collection upon which I am reporting contains six males and one female. Four of the males were taken at Medje in June and July, the other two at Niangara in November. The female was captured at Medje in September. The transverse band in the female is much lighter than in the males, inclining to yellowish.

(132) 3. **Kallimula sinuata** (Plœtz)

Precis sinuata Plœtz, 1880, Stett. Ent. Zeit., XLI, p. 477. Aurivillius, 1913, Seitz, Gross-Schmett., XIII, p. 222, Pl. lie.

Two males, one caught at Medje in August, the other at Niangara in November.

(133) 4. **Kallimula pelarga** (Fabricius)

Papilio pelarga Fabricius, 1775, Syst. Ent., p. 513.
Precis pelarga Aurivillius, 1913, Seitz, Gross-Schmett., XIII, p. 223.

Of this well-known species there are twenty-three specimens in the collection. One male was caught at Gamangui in February; two males were taken at Medje in August and a female at the same place in July; eight males and eight females were captured at Niangara in November; and there are two males and one female labelled as taken at Faradje "1911–1912."

(134) 5. **Kallimula leodice** (Cramer)

Papilio leodice Cramer, 1777, Pap. Exot., II, p. 64, Pl. cxxxviii, figs. *G*, *H*.
Precis leodice Aurivillius, 1913, Seitz, Gross-Schmett., XIII, p. 223.

There are eighty-eight specimens of this species or form, nine females and seventy-nine males; all were caught at Niangara in November, except one female, which was taken at Medje in August. Aurivillius regards it as being the dry-season form of *pelarga* (Fabricius).

(135) 6. **Kallimula harpyia** (Fabricius)

Papilio harpyia Fabricius, 1781, Spec. Ins., II, p. 104.
Precis harpyia Aurivillius, 1913, Seitz, Gross-Schmett., XIII, p. 223, Pl. li*d*.

The collection contains sixty specimens, forty-four males and sixteen females, all of which were captured at Niangara in November, except two males which were caught at Medje in August. According to Aurivillius this is an aberrant dry-season form of *pelarga*.

CATACROPTERA Karsch

(136) 1. **Catacroptera cloanthe** (Cramer)

Papilio cloanthe Cramer, 1781, Pap. Exot., IV, p. 93, Pl. cccxxxviii, figs. *A*, *B*.
Catacroptera cloanthe Aurivillius, 1913, Seitz, Gross-Schmett., XIII, p. 218, Pl. liic.

This insect, formerly included in the genus *Precis*, is indeed very closely related to the latter, but may easily be distinguished by its larger size, its robust form, and somewhat hirsute appearance, not to mention certain other minute anatomical differences which exist in both the imago and the larva. There is but one species, *C. cloanthe* (Cramer), of which two local races have been recognized by authors, one which is spread over the eastern and southern portions of the continent, to which the name given by Cramer strictly applies, the other *C. cloanthe ligata* Rothschild and Jordan, which according to these authorities is the northwestern race and extends from Senegal to Togo. The American Museum Congo Expedition brought back a small series of specimens which show that the two races commingle about the headwaters of the Uelle River and indicate a great eastward extension of the race originally described by Rothschild and Jordan from the northwestern areas of the Ethiopian subregion. This is, however, what might have been expected. *C. cloanthe* (typical) has no dark marginal line on the primaries; *C. cloanthe ligata* has such a line. Both forms have "wet-season" and "dry-season" subvarieties. The "dry seasonal" form in each case is light under the wings, and the "wet seasonal" form is dark.

The specimens, with the solitary exception of the female captured at Medje on August 1, 1910, were taken at Faradje and Niangara in November of that year. Three males and seven females, including the female taken at Medje in August, belong to the form *C. cloanthe ligata* Rothschild and Jordan; five males and six females belong to the "wet-season" form to which Staudinger applied the varietal name *C. obscurior*, in which the under side of both wings is quite dark brown.

SALAMIS Boisduval

(137) 1. **Salamis parhassus æthiops** (Palisot de Beauvois)

Papilio æthiops PALISOT de BEAUVOIS, 1805, Ins. Rec. en Afrique et Amérique, Lép., p. 22, Pl. III.

Salamis parhassus AURIVILLIUS, 1913, Seitz, Gross-Schmett., XIII, p. 217.

Sixteen specimens. One was taken at Gamangui in February and another at the same place in June. Four were caught at Niangara in November and all the rest were captured at Medje from June to September.

(138) 2. **Salamis cacta** (Fabricius)

Papilio cacta FABRICIUS, 1793, Ent. Syst., III, part 1, p. 116.

Salamis cacta AURIVILLIUS, 1913, Seitz, Gross-Schmett., XIII, p. 218, Pl. LC.

On the under side of the wings there is displayed a remarkable dissimilarity in color and maculation. No two specimens are exactly alike. This is true also of the very large series which we have from the French Congo and southern Cameroon. It is singular that some "species-maker" has not found pleasant recreation in naming and describing the different individuals which exist in various collections, each of which might give opportunity for the exercise of descriptive powers, especially if use were made of a binocular microscope, which has become such a fashionable adjunct in entomological and ichthyological research in recent years.

Twenty-five specimens, mostly males. One was taken at Bafwabaka in January, several at Niangara in November, but by far the largest number at Medje from May to September.

KALLIMA (Westwood)

(139) 1. **Kallima rattrayi** Em. Sharpe

Kallima rattrayi Em. Sharpe, 1904, Entomologist, p. 182. Aurivillius, 1913, Seitz, Gross-Schmett., XIII, p. 211.

The male is very much like that sex in *Kallima rumia*, of which this is probably a local race, but considerably smaller in size. The female is different in that the hind wings are concolorous and entirely without the broad whitish band which is always found in *K. rumia;* and in addition has a conspicuous white mark near the apex of the fore wing on the costal margin. The subapical transverse band is narrower than in *K. rumia*, and is not white, as in the female of that species, but bright straw-yellow.

Three males and a female caught at Medje (July–August), and a male captured at Niangara in November.

(140) 2. **Kallima ansorgei** Rothschild

Kallima ansorgei Rothschild, 1899, in Ansorge, 'Under the African Sun,' p. 319, Pl., fig. 1. Aurivillius, 1913, Seitz, Gross-Schmett., XIII, p. 211.

This seems to be quite distinct from *K. cymodoce* (Cramer), although it has the same form of the wings. It occurs in the eastern parts of Cameroon also, where *K. cymodoce* is likewise found, and there have been no intergrading varieties discovered thus far, to the best of my knowledge and belief. The species is represented in the collection by seven males taken at Medje.

HYPOLIMNAS Hübner

(141) 1. **Hypolimnas misippus** (Linnæus)

Papilio misippus Linnæus, 1764, Mus. Lud. Ulr., p. 264.
Hypolimnas misippus Aurivillius, 1913, Seitz, Gross-Schmett., XIII, p. 213.

There are eleven males and seven females of this common and widely distributed species. Three of the females belong to the varietal form *H. inaria* (Cramer). The specimens were all taken at Niangara in November 1910, except one female captured at Medje, August 11, and one male, which was taken at Faradje, without any indication on the label of the day and month.

(142) 2. **Hypolimnas salmacis** (Drury)

Papilio salmacis Drury, 1773, Ill. Exot. Ent., II, p. 14, Pl. viii, figs. 1–2.
Hypolimnas salmacis Aurivillius, 1913, Seitz, Gross-Schmett., p. 214, Pl. xlviii*b*.

The collection contains one hundred and sixty-two males and two females of this species, all taken at Medje. Of this number a few are labelled as having been captured in April, the rest were taken at dates ranging from July 8 to September 24, 1910. If collecting went on continuously at Medje this fact would indicate that there may be two broods annually.

There is some variation in the coloring of the upper side of the wings, a few specimens having a purplish tint contrasting with the purer blue of the markings of most of the specimens, and the white spots beyond the end of the cell of the fore wing in an occasional specimen are suffused with blue almost throughout their extent.

The two females in the collection belong to the form to which Suffert has applied the name *H. cissalma*, characterized by having the white of the paler spots replaced by yellow. The collection contains no males corresponding to the form *cissalma* in that sex, which Suffert describes as having all the lighter markings on the upper side, except the subapical spots, blue throughout.

(143) 3. **Hypolimnas monteironis** (Druce)

Diadema monteironis DRUCE, 1874, Cist. Ent., I, p. 286.

Hypolimnas monteironis AURIVILLIUS, 1913, Seitz, Gross-Schmett., XIII, p. 214, Pl. XLVII*b*.

This species, which has been by some authors regarded as a varietal form of the preceding but which is quite distinct, is represented in the collection by twenty-one males and one female. They all were taken at Medje, except one male which is ticketted "Niangara, November 14–16, 1910." Three of the males taken at Medje were captured in April, all of the other specimens bear dates ranging from July 8 to September 27, 1910. Like the preceding species, this probably has at least two annual broods.

(144) 4. **Hypolimnas mechowi** (Dewitz)

Diadema mechowi DEWITZ, 1884, Berl. Ent. Zeit., XXVIII, p. 187, Pl. I, fig. 2.

Hypolimnas mechowi AURIVILLIUS, 1913, Seitz, Gross-Schmett., XIII, p. 214, Pl. XLVII*d*.

This species is represented in the collection by a single male, which does not differ at all from specimens in the collection of the writer from the southern parts of Cameroon. It was taken at Bafwaboli, November 11, 1909.

(145) 5. **Hypolimnas bartteloti** Grose-Smith

Hypolimnas bartteloti GROSE-SMITH, 1890, Proc. Zool. Soc. London, p. 468; 1891, Rhop. Exot., I, *Hypolimnas*, Pl. I, figs. 1–2. AURIVILLIUS, 1913, Seitz, Gross-Schmett., XIII, p. 214.

Of this species and its varieties there are twenty-two examples, all of which are males. One specimen was taken at Avakubi, October 1, 1909; one at Lubila, September 20, 1909; all the rest at Medje, one on April 6, the remainder at dates ranging from July 8 to September 27, 1910.

There is considerable variability in the specimens due to the obsolescence of the subapical and submarginal spots. In four of the specimens belonging to this collection, as well as in numerous other specimens taken in Cameroon and which are before me as I write, these spots are wholly obliterated and I propose for this extreme form the varietal name *obliterata*.

(146) 5*a*. **Hypolimnas bartteloti obliterata,** new variety

Plate VI, Figure 5, ♂

Distinguished from the typical form by the complete obliteration of the subapical and submarginal spots on the upper side of both the fore and hind wings. Traces of the uppermost subapical and the lowermost submarginal spot are to be found on the lower side of the fore wing in some specimens, but not in all. In typical *H. bartteloti* the submarginal white spots form a continuous series, one in each interspace, though they may vary in size, in some specimens being quite large, in others being reduced to mere points.

The type of *H. bartteloti obliterata* is in The American Museum of Natural History; paratypes are in the same collection and in the Holland Collection in the Carnegie Museum. Medje and Cameroon.

(147) 6. **Hypolimnas dubia** (Palisot de Beauvois)

Papilio dubius PALISOT DE BEAUVOIS, 1805, Ins. Rec. en Afrique et Amérique, p. 238, Lep., Pl. VI, figs. 2*a*, 2*b*.

Hypolimnas dubia AURIVILLIUS, 1913, Seitz, Gross-Schmett., XIII, p. 215, Pl. XLVIII*a*.

There are ten males and two females of this species. One male was taken at Bafwabaka, December 9, 1909; two males were captured at Niangara in November 1910; the remaining nine specimens were taken at Medje, the dates of capture ranging from June 8 to September 27, 1910. The two females were taken in the first week in August.

There is some variation in the maculation of the specimens, particularly in the extent of the large white discal area of the hind wings, which in one specimen is rather broadly suffused with pale ochreous. This variability is characteristic of the species, as shown by numerous specimens coming from various parts of the continent in the collection of the writer.

(148) 7. **Hypolimnas anthedon** (Doubleday)

Diadema anthedon DOUBLEDAY, 1845, Ann. Mag. Nat. Hist., (1) XVI, p. 181; 1850, Gen. Diurn. Lep., II, p. 281, Pl. XXXVII, fig. 2.

Hypolimnas anthedon AURIVILLIUS, 1913, Seitz, Gross-Schmett., XIII, p. 215, Pl. XLVIIc.

There are twenty-two males and one female in the collection. The latter was taken at Medje in September 1910. One male is ticketted as from Bafwaboli, September 11, 1909; another as from Bafwasende, September 25, 1909; a third from Ngayu, December 11, 1909; a fourth from Niangara, November 9–10, 1910. The remaining specimens were taken at Medje, one on April 6, 1910, the rest at dates ranging from June 6 to October 4, 1910.

There is great uniformity in the specimens, and they differ in no respect from hundreds of others which have passed under the eye of the writer and which have come from all parts of tropical western Africa.

Eurytelinæ

EURYTELA Boisduval

(149) 1. **Eurytela hiarbas** (Drury)

Papilio hiarbas DRURY, 1782, Ill. Exot. Ent., III, p. 17, Pl. XIV, figs. 1, 2.

Eurytela hiarbas AURIVILLIUS, 1913, Seitz, Gross-Schmett., XIII, p. 209, Pl. XLIXe.

Four males and two females, Medje (July–August).

(150) 2. **Eurytela dryope** (Cramer)

Papilio dryope CRAMER, 1775, Pap. Exot., I, p. 125, Pl. LXXVIII, figs. *E*, *F*.

Eurytela dryope AURIVILLIUS, 1913, Seitz, Gross-Schmett., XIII, p. 210.

One male taken at Niangara, November 14, 1910.

(151) 3. **Eurytela alinda** Mabille

Eurytela alinda MABILLE, 1893, Ann. Soc. Ent. Belgique, XXXVII, p. 50. AURIVILLIUS, 1913, Seitz, Gross-Schmett., XIII, p. 210, Pl. XLIXe.

Six males caught at Medje (July-August).

NEPTIDOPSIS Aurivillius

(152) 1. **Neptidopsis ophione** (Cramer)

Papilio ophione CRAMER, 1777, Pap. Exot., II, p. 27, Pl. CXIV, figs. *E*, *F*.

Neptidopsis ophione AURIVILLIUS, 1913, Seitz, Gross-Schmett., XIII, p. 209, Pl. XLIXd.

Eleven specimens (two not expanded) taken at Medje, the dates of capture running from early in July to early in September.

ERGOLIS Westwood

(153) 1. **Ergolis enotrea** (Cramer)

Papilio enotrea CRAMER, 1779, Pap. Exot., III, p. 73, Pl. CCXXXVI, figs. *A*, *B*.
Ergolis enotrea AURIVILLIUS, 1913, Seitz, Gross-Schmett., XIII, p. 208, Pl. XLIX*c*.

Twenty-five specimens, nineteen males and six females, are included in the collection. They were all taken at Medje about the middle of the year, except two specimens which were captured at Niangara in November.

(154) 2. **Ergolis pagenstecheri** Suffert

Ergolis pagenstecheri SUFFERT, 1904, Iris, XVII, p. 125. AURIVILLIUS, 1913, Seitz, Gross-Schmett., XIII, p. 208, Pl. XLIX*c*.
Ergolis murina BARTEL, 1905, Nov. Zool., XII, p. 135.

Three male specimens taken at Medje in July.

(155) 3. **Ergolis actisanes** Hewitson

Ergolis actisanes HEWITSON, 1875, Ent. Mo. Mag., XI, p. 183. AURIVILLIUS, 1913, Gross-Schmett., XIII, p. 208, Pl. XLIX*c*.

This species is represented by five male specimens, four from Medje, two taken in July, and one in each of the months, August and September, the fifth being labelled as captured at Niangara in November.

MESOXANTHA Aurivillius

(156) 1. **Mesoxantha ethosea** (Drury)

Papilio ethosea DRURY, 1782, Ill. Exot. Ent., III, p. 51, Pl. XXXVII, figs. 3, 4.
Mesoxantha ethosea AURIVILLIUS, 1913, Seitz, Gross-Schmett., XIII, p. 208, Pl. XLIX*b*.

A single male captured at Medje, August, 1910. This is a quite common insect on the Ogové River, and the writer has a long series taken by the late Dr. A. C. Good at Kangvé.

BYBLIA Hübner

(157) 1. **Byblia crameri** Aurivillius

Byblia crameri AURIVILLIUS, 1894, Ent. Tidskr., XV, p. 279; 1913, Seitz, Gross-Schmett., XIII, p. 208, Pl. XLIX*c*, figured as "*B. vulgaris U.*"

This species or local race of *B. ilithya* is the one which prevails on the western coast from Sierra Leone to northern Angola, penetrating eastward as far as Uganda. It is remarkably constant throughout its range, as extensive series of specimens from many places show.

Eleven males and three females. One female was caught at Kwamouth, July 14, 1909, the other two at Niangara in November, 1910. Three males were taken at Medje in August, all the rest at Faradje and Niangara in November.

Eunicinæ

ASTEROPE Hübner

Asterope HÜBNER 1816, type *amulia* Cramer, 1779, Pap. Exot., II, Pl. CLXXX, figs. *C, D*.

Crenis BOISDUVAL 1833, type *madagascariensis*. Cf. Rothschild and Jordan, 1903, Nov. Zool., X, p. 528.

(158) 1. **Asterope occidentalium** (Mabille)

Crenis occidentalium MABILLE, 1876, Bull. Soc. Zool. France, I, p. 275. AURIVILLIUS, 1913, Gross-Schmett., XIII, p. 205, Pl. XLVIII*g*.

Asterope occidentalium ROTHSCHILD AND JORDAN, 1903, Nov. Zool., X, p. 529.

Fourteen specimens: one male taken at Gamangui in February; the rest captured at Medje (July–September).

(159) 2. **Asterope boisduvali** (Wallengren)

Crenis boisduvali WALLENGREN, 1857, Rhop. Caffr., p. 30. AURIVILLIUS, 1913, Seitz, Gross-Schmett., XIII, p. 205, Pl. XLVIII*g*.

Asterope boisduvali ROTHSCHILD AND JORDAN, 1903, Nov. Zool., X, p. 530.

Nineteen specimens, of which one was taken at Gamangui in June, two at Niangara in November, and the rest at Medje (May–September).

(160) 3. **Asterope natalensis** (Boisduval)

Crenis natalensis BOISDUVAL, 1847, Delegorgue, Voy. Afr. Australe, II, p. 592. AURIVILLIUS, 1913, Seitz, Gross-Schmett., XIII, p. 206.

Asterope natalensis ROTHSCHILD AND JORDAN, 1903, Nov. Zool., X, p. 531.

One male captured at Niangara in November.

Marpesiinæ

CYRESTIS Westwood

(161) 1. **Cyrestis camillus** (Fabricius)

Papilio camillus FABRICIUS, 1781, Spec. Ins., II, p. 11.

Cyrestis camillus AURIVILLIUS, 1913, Seitz, Gross-Schmett., XIII, p. 203, Pl. XLIX*b*.

Twenty-two specimens, mostly taken at Medje from May to September, though there are a couple captured at Niangara in November and one from Bafwabaka caught in January.

Neptidinæ

NEPTIS Fabricius

The genus *Neptis* is well represented in the woodlands of Africa. The collection upon which I am reporting contains a number of species which are already more or less well known and some rarities.

(162) 1. **Neptis metella** Doubleday and Hewitson

Neptis metella Doubleday and Hewitson, 1850, Gen. Diurn. Lep., II, p. 272, Pl. xxxv, fig. 2. Holland, 1892, Ent. News, III, Pl. ix, fig. 3.

Nine specimens, all taken at Medje in July and August, except one caught at Gamangui in June.

(163) 2. **Neptis marpessa** Hopffer

Neptis marpessa Hopffer, 1855, Monatsber. Akad. Wiss. Berlin, p. 640; 1862, Peters, Reise n. Mossambique, Ins., p. 383, Pl. xxiv, figs. 9, 10.
Neptis pasteuri Snellen, 1882, Tijd. v. Ent., XXV, p. 221.
Neptis marpessa Aurivillius, 1912, Seitz, Gross-Schmett., XIII, p. 199.

One specimen was captured at Niangara, November 20, 1910. This is the continental form of the insect which is found in Madagascar and was named *N. saclava* by Boisduval. It is very abundant on the eastern coast and I have long series from Natal and Mombasa.

(164) 3. **Neptis nemetes** Hewitson

Neptis nemetes Hewitson, 1868, Exot. Butt., IV, *Neptis*, Pl. i, figs. 1, 2. Holland, 1892, Ent. News, III, Pl. ix, fig. 4.

Seven specimens, one taken at Kwamouth, July 15, one from Risimu, taken September 8, 1909, the rest from Medje, June to August.

(165) 4. **Neptis agatha** (Stoll)

Plate VI: Figure 8, Forest Form, ♂; Figure 7, Open Country Form, ♂

Papilio agatha Stoll, 1780, in Cramer's Pap. Exot., IV, p. 76, Pl. cccxxvii, figs. *A*, *B*.
Neptis agatha Aurivillius, 1912, Seitz, Gross-Schmett., XIII, p. 200, Pl. xlviii*d*.

Of this species the collection contains eighty-seven specimens, including some of the varieties to which discriminating students have given names founded in some cases upon the measurement of the size of the spots and bands. The form *lativittata* Strand, the author of which informs us that the mesial band of the secondaries is eight millimeters wide, is represented. I discover that all of the specimens falling into this category are large and well-developed females, as is also the case with a lot of specimens I have from other parts of Africa. I call into question the specific validity of this so-called "species," which is not even a variety.

I note, however, that there is a distinction, which I do not believe has been previously pointed out, between the specimens which come from the hot woodlands and those from the more open country of the eastern and southern grass-lands. As it happens, most of the specimens representing this species were taken at Niangara and Faradje.

They agree perfectly with specimens taken on the hills back of Mombasa, of which I have a long suite, and with series of specimens coming from Natal and other more southern localities. By selecting from the mass all those which were caught at Medje about the middle of the year, I discover that the latter as a group are not only generally larger but have the transverse mesial band of the primaries a little straighter and narrower than the other lot of specimens. Comparing them with long suites of specimens coming from Cameroon, Sierra Leone, and the valley of the Ogové, I discover that the specimens from Medje are identical in appearance with these, and that there is a slight but constant difference between the whole assemblage of specimens from the wooded tropics and those which come from the steppes of the east and the south. By pinning out fifty of each of the forms selected according to locality, as I have done, the different facies of the two lots becomes very apparent and striking to the eye, even more so than when only two individuals are compared with each other.

(166) 5. **Neptis seeldrayersi** Aurivillius

Neptis seeldrayersi Aurivillius, 1895, Ent. Nachr., p. 379; 1898, Rhop. Æthiop., p. 167, Pl. i, fig. 7; 1912, Seitz, Gross-Schmett., XIII, p. 200, Pl. xlviii*d*.

Eight specimens, all taken at Medje in July and August. There is some individual variability. In one specimen the fourth white spot reckoning from the costa is obsolete in the mesial band and gives the wing a different facies. The species is not uncommon farther west and we have it in some numbers from the region of the Ogové River.

(167) 6. **Neptis nysiades** Hewitson

Neptis nysiades Hewitson, 1868, Exot. Butt., IV, *Neptis*, Pl. i, figs. 3, 4.

Six males and four females, all caught at Medje, the dates of capture including April, July, August, and September.

(168) 7. **Neptis metanira** Holland

Neptis metanira Holland, 1892, Ent. News, III, Pl. ix, fig. 6.

Aurivillius, in the 'Rhopalocera Æthiopica,' expresses the opinion that this form is simply an aberration of the preceding species. He may be right but, as the insect has a very different facies from *N. nysiades* on the upper side, though I agree that it closely resembles *nysiades* on the under side, and, as it is constantly turning up and we have quite a good series from Cameroon and other parts, I am inclined to let the matter stand as I originally put it until the test of breeding shall show that Dr. Aurivillius is correct in his surmise.

One male, taken at Medje, August 13, 1910.

(169) 8. **Neptis continuata** Holland

Neptis biafra var. *continuata* Holland, 1892, Ent. News, III, Pl. ix, fig. 9.

Aurivillius in the 'Rhopalocera Æthiopica' says that this is, like the preceding, an aberration of *N. nysiades* Hewitson. I admit that I was in error in making it a varietal form of *N. biafra* Ward, which is a different insect, though there are resemblances on the under side of the wings which led me to take the step. I have a good series of this thing from various localities, many more than I had when I first named the insect. As it is every now and then being received from different parts of the hot lands of Africa and is quite constant and recognizable, I am inclined to apply the remarks which I made under the preceding species and let the matter stand until we shall receive more light. It is not conspecific with *N. biafra* Ward, as I have already said. The figure of the latter insect, which I gave on the same plate in the Entomological News, is that of a typical *N. biafra*, ♂, and it does not take much effort to see the great difference between the two insects. Twenty-six years of study since I wrote that article on the genus *Neptis* has broadened my knowledge of the subject.

There are four examples of this form, three of which were taken at Medje in July and August, the fourth at Munie Katoto, September 1909.

(170) 9. **Neptis nicomedes** Hewitson

Neptis nicomedes Hewitson, 1874, Ent. Mo. Mag., X, p. 205. Kirby, 1894, Handbook Lep., I, p. 147, Pl. xx, fig. 3.

I refer to this species four specimens which agree both with the description and the figure cited above, except that all of them have the mesial band of the primaries slightly inangulated on its inner margin at vein 4, thus resembling the variety *quintilla* Mabille.[1] The only difference which I am able to affirm definitely between typical *nicomedes* and *quintilla* is the fact that in the latter the longitudinal streak in the cell of the fore wing is reduced and obsolete basad and persists merely as a short bar or curved line near the end of the cell. I have good specimens of *N. quintilla* which were collected in Cameroon, before me as I write, and quite agree with Dr. Aurivillius in regarding the two forms as merely varietal.

The specimens upon which I am reporting were taken at Medje, one in June, one in July, and two in August. There are two males and two females.

---

[1] Kirby's figure is poorly executed and may not be true to type.

(171) 10. **Neptis strigata** Aurivillius

Neptis strigata AURIVILLIUS, 1894, Ent. Tidskr., XV, p. 284, fig. 10; 1913, Seitz, Gross-Schmett., XIII, p. 201, Pl. XLVIIIe.

There are five specimens of this species, three males and two females, all taken at Medje, except one of the females which was caught at Pawa in October. The dates of capture at Medje cover the months of April, July, August, and September. One of the specimens agrees so closely with the figure given by Aurivillius in the 'Gross-Schmetterlinge' (*loc. cit.*) that it might have served the artist as his model. The rest do not have the longitudinal streak in the cell of the fore wings divided into two parts, but at the point where this division is shown in the figure given by Aurivillius there is a small black spot which, by becoming only a little larger, would cause the band to be interrupted as shown by the author of the species. We have this insect also from Cameroon and the Ogové Valley.

(172) 11. **Neptis biafra** Ward

Plate VIII, Figure 3, ♀

Neptis biafra WARD, 1871, Ent. Mo. Mag., VIII, p. 121; 1874, Afr. Lep., p. 12, Pl IX, figs. 1, 2. HOLLAND, 1892, Ent. News, III, Pl. IX, fig. 10, ♂.

The collection contains one female caught at Medje, June 30, 1910. In this specimen the two small spots at the basal end of the cell of the fore wing coalesce, while the larger spot at the end of the cell remains free. We have some fine specimens of the male in our collections gathered for us in Cameroon and on the Ogové River. It is one of the most beautiful of the species in the genus and is related to *N. strigata* but is larger and more strikingly marked. I strongly suspect that my valued friend, Dr. Aurivillius, was in some doubt as to the identification of *N. biafra*, both when he queried the identity of my figure of the male with his *N. strigata*, as he does in the 'Rhopalocera Æthiopica,' and when in the 'Gross-Schmetterlinge der Erde' he places *N. biafra* in another group, separate from *strigata*, to which it is allied, and gives a description, which is not at all conformed to the description given by the author of the species. I wish to say that the figure of *N. biafra* given by me in the Entomological News is that of a specimen which conforms absolutely to the description of Ward, and that the insect, while not far removed from *N. strigata*, is totally distinct. With a good series of both species before me for comparison, I am able to affirm this positively.

(173) 12. **Neptis nicoteles** Hewitson

Neptis nicoteles HEWITSON, 1874, Ent. Mo. Mag., X, p. 206. HOLLAND, 1892, Ent. News, III, Pl. IX, fig. 8.

One male, lacking head and antennæ, taken at Medje, July 13, 1910.

(174) 13. **Neptis nicobule** Holland

Neptis nicobule Holland, 1892, Ent. News, III, p. 249, Pl. ix, fig. 7. Aurivillius, 1898, Rhop. Æthiop., p. 168; 1913, Seitz, Gross-Schmett., XIII, p. 202.

One male, taken at Gamangui, June 17, 1910. It agrees perfectly with the type with which it has been compared.

(175) 14. **Neptis lermanni** Aurivillius

Neptis lermanni Aurivillius, 1896, Öfvers. Sv. Vet. Akad. Förh., LIII, p. 431; 1913, Seitz, Gross-Schmett., XIII, p. 202, Pl. xlviii*f*.

Seven males and three females: two males caught at Gamangui in June; all the rest at Medje, from June to August.

(176) 15. **Neptis melicerta** (Drury)

Papilio melicerta Drury, 1773, Ill. Exot. Ent., II, p. 34, Pl. xix, figs. 3, 4.

Neptis melicerta Holland, 1892, Ent. News, III, Pl. ix, fig. 5. Aurivillius, 1913, Seitz, Gross-Schmett., XIII, p. 202, Pl. xlviii*e*.

Of this common insect there are thirty-five examples, all taken at Medje from July to September, except two which were captured at Niangara in November.

NEPTIDOMIMA, new genus

(177) 1. **Neptidomima exaleuca** (Karsch)

Neptis exaleuca Karsch, 1894, Berl. Ent. Zeit., XXXIX, p. 9, fig. 5. Aurivillius, 1913, Seitz, Gross-Schmett., XIII, p. 202.

There is a single specimen of this rare and curious insect, taken at Medje in July. Although it agrees in the neuration of the wings with the genus *Neptis*, I nevertheless think that it should be separated generically from that genus because of the structure of the palpi, which are more robust, porrect, and hirsute than in any species of *Neptis* known to me. Furthermore, the insect is throughout more robust in its structure than is the case in the genus *Neptis*. I propose the generic name **Neptidomima** for the creature, of which genus it is the type.

Nymphalinæ

PSEUDACRÆA Westwood

(178) 1. **Pseudacræa hostilia warburgi** Aurivillius

Pseudacræa hostilia var. *warburgi* Aurivillius, 1892, Ent. Tidskr., XII, p. 200; 1912, Seitz, Gross-Schmett., XIII, p. 194, Pl. xlvi*e*.

One male, captured at Medje, August 1910.

(179) 2. **Pseudacræa semire** (Cramer)

Papilio semire Cramer, 1779, Pap. Exot., III, p. 3, Pl. cxciv, figs. *B*, *C*.
Pseudacræa semire Aurivillius, 1912, Seitz, Gross-Schmett., XIII, p. 194, Pl. xliv*a*.

Four males: one taken at Gamangui in June, and three caught at Medje in July and August.

(180) 3. **Pseudacræa lucretia** (Cramer)

Papilio lucretia Cramer, 1775, Pap. Exot., I, p. 71, Pl. xlv, figs. *C*, *D*.
Pseudacræa lucretia Aurivillius, 1912, Seitz, Gross-Schmett., XIII, p. 197, Pl. xlvi*a*.

Represented by fifty-four specimens, nineteen of which are not expanded. The specimens were mainly taken at Medje, though about half a dozen bear other scattering locality labels. The dates of capture range from May into September.

The typical form is well represented, but the majority of the specimens belong to the slight variety named *Pseudacræa protracta* by Butler in which the light discal area of the hind wing is yellowish instead of pure white as in the typical form. But there are intergrades and it is hard to say in the series where one form begins and the other ends.

(181) 4. **Pseudacræa clarki** Butler

Pseudacræa clarki Butler, 1892, Trans. Ent. Soc. London, p. 201, Pl. x, figs. 1, 1*a*. Aurivillius, 1912, Seitz, Gross-Schmett., XIII, p. 197, Pl. xlvi*b*.

This lovely butterfly is represented by six males taken at Medje (July to September).

(182) 4*a*. **Pseudacræa clarki egina** Aurivillius

Pseudacræa clarki var. *egina* Aurivillius, 1912, Seitz, Gross-Schmett., XIII, p. 197.

Four males taken at Medje (May to June) and one at Niangara in November.

(183) 5. **Pseudacræa gottbergi** Dewitz

Pseudacræa gottbergi Dewitz, 1884, Berl. Ent. Zeit., XXVIII, p. 187, Pl. i, fig. 1. Aurivillius, 1912, Seitz, Gross-Schmett., XIII, p. 197, Pl. xlvi*b*.

Five males: four taken at Medje (June to September) and one at Munie Katoto, September 10, 1909.

(184) 6. **Pseudacræa hobleyi** Neave

Pseudacræa hobleyi Neave, 1904, Nov. Zool., XI, p. 331. Aurivillius, 1912, Seitz, Gross-Schmett., XIII, p. 196.

One female taken at Medje, June 28, 1910. The subapical band of the fore wing is a trifle wider than usual.

PSEUDONEPTIS Snellen

(185) 1. **Pseudoneptis cœnobita** (Fabricius)

Papilio cœnobita FABRICIUS, 1793, Ent. Syst., III, part 1, p. 247.
Pseudoneptis cœnobita AURIVILLIUS, 1912, Seitz, Gross-Schmett., XIII, p. 193, Pl. XLVI*b*.

Thirty specimens, mostly males, a few of which were taken at Gamangui in June, the rest at Medje in the middle months of the year.

CATUNA Kirby

(186) 1. **Catuna crithea** (Drury)

Papilio crithea DRURY, 1773, Ill. Exot. Ent., II, p. 29, Pl. XVI, figs. 5, 6.
Catuna crithea AURIVILLIUS, 1912, Seitz, Gross-Schmett., XIII, p. 192.

Thirty-one specimens, mostly males, taken at Medje from June to September.

(187) 2. **Catuna angustata** (Felder)

Euomma angustatum FELDER, 1867, Reise Novara, Lep., III, p. 425.
Catuna angustata AURIVILLIUS, 1912, Seitz, Gross-Schmett., XIII, p. 192.

Fifty-seven specimens taken at the same place and times as the foregoing species.

(188) 3. **Catuna oberthüri** Karsch

Catuna oberthüri KARSCH, 1894, Berl. Ent. Zeit., XXXIX, p. 4. AURIVILLIUS, 1912, Seitz, Gross-Schmett., XIII, p. 192, Pl. XLVI*d*, *e*.

Twenty-two examples to which the remarks made under the two preceding species apply.

In addition to the specimens enumerated above there are in the collection thirty-nine unexpanded specimens representing all of the three species, but which cannot be separated easily without being spread so that the upper side of the wings can be examined.

CYNANDRA Schatz

(189) 1. **Cynandra opis** (Drury)

Papilio opis DRURY, 1773, Ill. Exot. Ent., II, p. 33, Pl. XVIII, figs. 5, 6.
Cynandra opis AURIVILLIUS, 1912, Seitz, Gross-Schmett., XIII, p. 191, Pl. XLVI*e*, ♂, ♀.

Of this insect there are five males and eight females, all of which were taken at Medje, except one badly damaged male and one female which were taken at Niangara, in November 1910. The dates of capture at Medje include the months of April, June, July, August, and September.

ATERICA Boisduval

(190) 1. **Aterica galene** (Brown)

Papilio galene BROWN, 1776, New Ills. of Zool., p. 94, Pl. XXXVII.
Aterica theophane HOPFFER, 1855, Monatsber. Akad. Wiss. Berlin, p. 641.
Aterica galene AURIVILLIUS, 1912, Seitz, Gross-Schmett., XIII, p. 191, Pl. XLVIII*a*, *b*.

There are thirty males and twenty-three females of this species and its varieties. The form *theophane* is an extreme in which the light area of the hind wing is broadly suffused with red, but there are intergrading specimens connecting up these with such specimens as have the light area quite white. One male is labelled as having been captured at Noki in Angola, a few came from Gamangui and were taken in June, but the great majority were captured at Medje in the middle months of the year.

HAMANUMIDA Hübner

(191) 1. **Hamanumida dædalus** (Fabricius)

Papilio dædalus FABRICIUS, 1775, Syst. Ent., p. 482.
Hamanumida dædalus AURIVILLIUS, 1912, Seitz, Gross-Schmett,. XIII, p. 191, Pl. XLVI*f*.

Of this form, which differs from the following by the duller coloring of the lower side of the wings and the partial suppression of the white spots on that side, there are sixteen males and five females taken at Niangara in November.

(192) 1*a*. **Hamanumida dædalus meleagris** (Cramer)

Papilio meleagris CRAMER, 1775, Pap. Exot., I, p. 102, Pl. XLVI, figs. *A*, *B*.
Hamanumida meleagris AURIVILLIUS, 1912, Seitz, Gross-Schmett., XIII, p. 191, Pl. XLVI*f*.

This variety is represented by a long series of males and females, all of which were taken at Niangara and Faradje in November, except one taken at Noki in Angola, June 24, 1909, and another caught at Avakubi in November 1909.

The two forms, *H. dædalus* and *H. meleagris*, intergrade and, as both were taken at Niangara in large numbers at the same time of the year, the opinion of Dr. Aurivillius that they represent seasonal forms is open to question. They are mere color varieties, *H. dædalus* having the under surface dull and the white spots for the most part suppressed, and *H. meleagris* having the under surface of the wings brighter and the white spots present.

The writer has a large series of both forms collected for him on the Ogové River and at Gaboon by the late Dr. A. C. Good and these, too, by the dates of capture seem to confirm the opinion that the two forms are probably the issue of one and the same brood and that they are not "seasonal varieties" in the sense in which that term must be accepted.

EUPHÆDRA Hübner

The genus *Euphædra* is one of the most puzzling genera among the diurnal Lepidoptera of Africa. A vast number of so-called species, or forms, have been distinguished by writers, in many instances based apparently upon solitary individuals coming into their possession without sufficient material at hand to institute broad comparisons. Until in coming years some careful student on the ground shall succeed in breeding these insects from ova laid by individual females there necessarily will remain more or less confusion in certain groups. This is especially true of the forms allied to *E. preussi* Staudinger, *E. ceres* (Fabricius), and *E. xypete* (Hewitson).

Of these I have before me as I write a vast assemblage of specimens, many of which were brought home by the American Museum Congo Expedition. For example, there were collected by this expedition one hundred and eight specimens representing *E. preussi* and varieties, males and females. We have in the collections contained in the Carnegie Museum as many more from various localities. In all this assemblage of specimens it is almost impossible to find two individuals in either sex which are absolutely alike. There are slight differences in the shade of color on both the upper and under sides, in the number of spots in the cells on both sides of the wings, and in the discal and submarginal markings, which may be strongly, feebly, or not at all indicated. In addition to this, a close and accurate study of the literature shows that the descriptions and the figures which have been given by authors represent individuals rather than species; so that it is exceedingly difficult to state in exact terms where one so-called species begins and another ends in this group. The same remarks apply to other so-called "species," in other groups in which almost infinite variety is plainly visible, but appearing to me to have as little real significance as the shape and location of the spots on common cattle. On the other hand, there are certain forms recognized by authors which appear to be quite constant over the entire range in which they occur and which are not difficult to discriminate. In some cases, however, it may well be, as has been suggested, that some of these which are not distantly related to each other may, when the test of breeding is applied, turn out to be mere color varieties or seasonal forms which have not as yet been recognized as such. The genus as a whole presents as much difficulty to the systematist as the genus *Argynnis* and, in fact, I am disposed to regard it as more difficult than the latter genus. The arrangement and classification of the specimens contained in the collection upon which I am now reporting must, therefore, in certain of the groups be regarded as in a measure provisional.

I. PERSEIS GROUP

(193) 1. **Euphædra imitans** Holland

Plate VII, Figure 2, type, ♀

Euphædra imitans HOLLAND, 1893, Canad. Ent., XXV, p. 3. AURIVILLIUS, 1898, Rhop. Æthiop., p. 185; 1912, Seitz, Gross-Schmett., XIII, p. 190.

Of this well-marked species, which has never before been figured, there are in the collection one male and three females, all taken at Medje, the male on September 27, one of the females in July, and two of the females in August 1910.

II. RUSPINA GROUP

I may say in passing that I assign *E. crowleyi* Kirby to this group. It is a small species, which Aurivillius in error classifies under *Euptera*, but I have both males and females which show that the insect is a true *Euphædra*.

(194) 2. **Euphædra ruspina** (Hewitson)

Romalæosoma ruspina HEWITSON, 1865, Exot. Butt., III, *Romalæosoma*, Pl. II, figs. 6, 7.

Euphædra ruspina AURIVILLIUS, 1898, Rhop. Æthiop., p. 185; 1912, Seitz, Gross-Schmett., XIII, p. 190, Pl. XLII*b*. (In error designated on the plate as *E. eleus*.)

Of this well-known species there are eleven males and three females. All of the males and two of the females are labelled as captured at Medje; one female is marked as taken at Gamangui in July.

III. ELEUS GROUP

(195) 3. **Euphædra eleus** (Drury)

Papilio eleus DRURY, 1782, Ill. Exot. Ent., III, p. 14, Pl. XII, figs. 1, 2.

Euphædra eleus AURIVILLIUS, 1898, Rhop. Æthiop., p. 185; 1912, Seitz, Gross-Schmett., XIII, p. 190, Pl. XLII*b*. (Middle figure, ♀, erroneously labelled *ruspina* on plate.)

The figure of *E. eleus* given by Drury does not appear to be fortunate. The insect on his plate (*loc. cit.*) is represented as having the hind wing strongly produced at the anal angle. Such a specimen, so far as my knowledge goes, does not exist, and I think the outline of the wing in his drawing is due to the fancy of the draftsman, who has exaggerated in this respect. The color and markings of the upper side of the wings in all other respects agree with the multitude of specimens before me, which may be accepted as typical *E. eleus*. The color and markings of the lower side of the wings in Drury's figure represent an extreme variety.

Of what I long have determined to be *E. eleus* (Drury) there are in the collection nine males and four females, all taken at Medje at dates ranging from June to September, except one female which was taken at Niangara in November 1910. These specimens all have the transverse subapical band white, relatively narrow, consisting of four spots of which the third, reckoning from the costa, is the largest, and the ground-color of both wings is dark brownish red as shown in Drury's figure.

(196) 3*a*. **Euphædra eleus hybrida** Aurivillius

Euphædra eleus ab. *hybridus* (Staudinger, *in litt.*), AURIVILLIUS, 1898, Rhop. Æthiop., p. 186; ab. *hybrida* AURIVILLIUS, 1912, Seitz, Gross-Schmett., XIII, p. 190.

This varietal form, or subspecies, is represented in the collection by twenty-five males and thirteen females. The dark apical area and, to some extent, the dark marginal band of the secondaries in these specimens, shows in certain lights a greenish luster. In the males the subapical transverse band is, in almost all cases, composed of only three spots, yellowish white in color, the lowermost of which is the largest. In ten of the specimens in the collection there is, however, a fourth spot indicated as a mere pointlet in the interspace between the second and third submedian nervules. The red ground-color of the wings is much paler than in typical *eleus*, being orange-red and not dark brown.

The specimens were almost all taken at Medje, at dates ranging from June to September, though there are several specimens, both male and female, recorded as captured at Gamangui in June, a male taken at Niangara in November, and a female at Avakubi in October.

This varietal form with the paler ground-color of the wings, the greenish luster of the dark margins, and the yellow subapical bands, when pinned out in a series, contrasts rather strikingly with the darker colored specimens which I refer to *E. eleus* Drury, but when it comes to a comparison of the under side of the wings the difference is so trifling as to make it appear certain that the two forms are merely varietal.

(197) 3*b*. **Euphædra eleus coprates** (Druce)

Romalæosoma coprates Druce, 1875, Proc. Zool. Soc. London, p. 411.

Euphædra eleus var. *coprates* Aurivillius, 1898, Rhop. Æthiop., p. 186; 1912, Seitz, Gross-Schmett., XIII, p. 190, Pl. xlii*a*, ♂ (in error *hybridus*), Pl. xlii*b*, ♀.

Of this varietal form, distinguished by the presence of spots in the cell of the fore wings, both on the upper and under side, there are three males taken at Medje, one in June and the other two in August.

(198) 4. **Euphædra edwardsi** (Hoeven)

Aterica edwardsi Hoeven, 1845, Tijd. Nat. Gesch., XII, p. 251, Pl. iv, figs. 1*a*, 1*b*.

Romalæosoma pratinas Doubleday and Hewitson, 1850, Gen. Diurn. Lep., II, p. 284, Pl. xxxviii, fig. 3, ♂.

Euphædra edwardsi Aurivillius, 1898, Rhop. Æthiop., p. 186; 1912, Seitz, Gross-Schmett., XIII, p. 189, Pl. xlii*c* (♀, *non* ♂, as figured on plate).

The collection contains one female taken at Medje on July 29, 1910.

IV. CERES GROUP

As already indicated, the collection contains a great many specimens referable to this group showing innumerable slight variations in color and markings, so that it becomes very difficult to determine by fixed lines specific and varietal distinctions.

(199) 5. **Euphædra preussi** Staudinger (?)

Euphædra preussi Staudinger, 1891, Iris, IV, p. 119, Pl. i, fig. 1.

To this species I refer, with some doubt, eighteen males and four females, all taken at Medje, at dates ranging from July to September, except one male captured at Niangara in November and one female taken at Bafwasende on January 7, 1910.

Not one of these specimens agrees absolutely on the lower side with the figure given by Staudinger, though the males agree almost perfectly with the figure which he gives of the upper side of the wings. In this connection it is to be observed that the insect figured as *E. preussi* by Aurivillius in Seitz, 'Gross-Schmetterlinge,' XIII, Plate xlii*d*, is not the insect figured by Staudinger in Iris (*loc. cit.*) but represents the variety named *njamnjami* by Staudinger. Staudinger's figure represents an insect which is bright ochraceous on the under side. The insects upon which I am reporting are prevalently greenish on the under side, though some of them are brownish, but almost all are inclined to be more or less ochraceous on the inner margin of the lower side. The number of the spots in the cells of both the fore and hind wings on the lower side is somewhat variable. All have a pale discal spot beyond the cell, while in some specimens this discal spot forms the lower end of a pale band extending costad to the pale costal marginal border. No two specimens are absolutely alike. The submarginal spots on the upper and under side are also variable, though generally indicated on the upper side, and sometimes quite strongly; in other specimens, particularly on the lower side, these submarginal spots are more or less obsolete. The transverse apical band in the males is, as in Staudinger's figure, narrow and greenish, and the apical region on the upper side in the males is more or less suffused with green. In the females the transverse subapical band is white, showing strongly against the black apical area of the fore wings on the upper side, and is composed of four spots. None of the specimens are absolutely typical *E. preussi* Staudinger, but knowing, as I do, how greatly these insects tend to vary, I am not inclined to set up a new species merely basing it upon the slightly different shade of the lower side of the wings.

(200) 5*a*. **Euphædra preussi njami** Staudinger

Euphædra preussi var. *njami* Staudinger, 1891, Iris, IV, p. 125.

I refer to this varietal form erected by Staudinger twenty-one males and six females, all taken at Medje at dates ranging from April to September, except two males taken at Niangara in November and one female captured at Gamangui in June.

Staudinger differentiates this form from his *E. preussi* by stating in his description that the fore wings of the male on the upper side are darker, not laved with green, and that on the under side they are ferruginous and, further, that the submarginal spots on the lower side are distinctly visible. The long series of specimens before me which I refer to this form correspond closely with Staudinger's description, but there is considerable variability in the shading of the upper and under sides of the wings. On the upper side, some are distinctly greenish; in others the ground-color passes into bluish green. On the under side, some are indeed ferruginous, as he states; others, however, are somewhat greenish, and no two are absolutely alike in every minute particular. Almost all have a small light spot on the under side of the secondaries beyond the end of the cell, and in some specimens this light spot is extended costad, forming a light bar which loses itself in the pale costal border. There is extreme variability in this respect. The females are like the females of typical *preussi*, but almost all of them have the pale discal transverse band on the secondaries running from the end of the cell upward toward the costa more distinctly marked than in the males.

(201) 5*b*. **Euphædra preussi njamnjami** Staudinger

Euphœdra preussi var. *njamnjami* STAUDINGER, 1891, Iris, IV, p. 125.
Euphœdra preussi AURIVILLIUS, 1912, Seitz, Gross-Schmett., XIII, p. 189, Pl. XLII*d*.

To this varietal form, characterized by Staudinger as having the upper side of the wings black and not laved with green at the apex as in typical *preussi*, the under side ferruginous, without submarginal markings, I refer twelve males and twenty-one females from Medje and Gamangui. The males and females are all distinctly somewhat larger in size than either of the two foregoing forms. The outer two-thirds of the wings of the males are black, the subapical transverse band narrow, composed of four spots separated by the nervules, and the lower side without submarginal markings save as these may be indicated by small white dots in a few of the specimens. The prevalent color of the under side of the wings is brownish ochraceous, or ferruginous more or less laved with green in the case of the males, but not in the case of the females. As in the two preceding forms, the hind wings beyond the end of the cell may have a discal light spot, or this light spot may be extended costad in the form of a pale transverse discal band, losing itself in the light costal margin.

While I am averse to adding to the apparent interminable confusion which already exists in this species, I am, nevertheless, constrained by facts which are too apparent to be overlooked to set off from among the specimens before me several varietal forms which are quite as worthy of being discriminated as those which have already been mentioned.

(202) 5*c*. **Euphædra preussi notata,** new variety

Plate XI, Figure 1, ♂

I apply this name to two males and three females before me. The males and females are relatively smaller than any specimens of the varieties *njami* Staudinger and *njamnjami* Staudinger, which they resemble on the upper side of the wings, save that at the end of the cell on the upper side of the secondaries they all have a distinct black spot. On the under side the ground-color of the wings is chocolate-brown, with a more or less bluish suffusion, and the spots in the cell of both the fore and hind wings are large and distinct, and the submarginal spots are also well indicated, having an inner dark nucleus accentuated externally by light spots. The transverse subapical band in the males is pale whitish green; in the females pure white. Expanse, ♂, 65–67 mm.; ♀, 70–80 mm.

The type ♂ and allotype ♀ are in the The American Museum of Natural History; two paratypes in the Holland Collection in the Carnegie Museum. All are from Medje.

(203) 5*d*. **Euphædra preussi subviridis,** new variety

Plate XI, Figure 4, ♂

Closely resembling *E. preussi*, but with the upper outer two-thirds of the fore wings in the case of the male velvety black, the postapical transverse band diffuse, greenish, and toward the apex fading into a lustrous green subapical area which, in certain lights, shows as a brilliant green tract covering the apical area from near the apex to the outer end of the cell; the hind wings and the posterior margin of the fore wing for some distance iridescent greenish blue, this area on the fore wings reaching the lower margin of the cell near the base, but not reaching the outer angle. The posterior wings broadly bordered with dark green, accentuated with a submarginal series of black velvety spots. On the under side in the male the wings are more or less grass-green, tinged with chocolate-brown, the transverse subapical band of the primaries being whitish. The spots in the cells of the primaries and the secondaries are variable in number and size, as is true of all the varieties, and this is also true of the submarginal series of dark spots. The female is marked on the upper side like the male except that the transverse subapical band is pure snow-white. The outer margins, as in all the forms of *E. preussi*, have the fringes dark, interrupted on the interspaces with white, and the fore wings are at the apex tipped with white.

There are two males and one female from Medje which I refer to this form. The male and female types are in The American Museum of Natural History; the second male, a paratype, is in the Holland Collection in the Carnegie Museum.

This form, which is near typical *preussi*, may be at once distinguished from it by the velvety black band which crosses the fore wings from the base to the outer margin, leaving the diffuse paler subapical transverse band and the elongated brilliantly green apical area in striking contrast with the rest of the wing, and by the brilliantly deep green color of the under side of the wing.

(204) 5*e*. **Euphædra preussi fulvofasciata,** new variety

Plate XI, Figure 6, ♂

This variety differs from the preceding in having the transverse subapical band on the upper sides of the primaries bright orange in both sexes; the band on the under side is paler, inclining to white, though in a few specimens in the series before me the orange color of the upper side reappears. There is a considerable variety in the shape of this band, especially in the female sex. There are seven females before me, and in none of them is the band absolutely the same in outline, and in some of them it is much broader than in others. The markings on the under side are more or less variable, as in *E. njamnjami* and the other varietal forms which have been mentioned.

I assign to this varietal form three males taken at Medje, one in April, one in July, and one in August, and seven females, all taken at the same place, two in April and the others from July to September. In size and in all other respects, except the color and shape of the subapical band, the form agrees rather closely with *E. njamnjami* Staudinger, from which, however, it may easily be discriminated.

(205) 5*f*. **Euphædra preussi latefasciata,** new variety

Plate XI, Figure 8, ♂

This form is very much like the preceding but differs in having the transverse subapical band of the fore wing broader, and by the great reduction, amounting to almost a complete suppression on the under side of the black markings in the cells, especially in the case of the female. The submarginal markings on the under side of the secondaries on the other hand are very distinct, inwardly black, margined externally by light blue.

This variety is represented by a male captured at Medje in April and a female taken at the same place in July.

(206) 5*g*. **Euphædra preussi angustior,** new variety

Plate XI, Figure 7, ♂

I apply this name to four males and two females which are characterized by having the transverse postapical band orange on the upper side of the fore wings and greatly reduced in width, being much narrower than in any of the other forms in this group. On the under side the spots in the cell of the fore wing are much enlarged and very conspicuous, much more so than in any other of the varieties hereinbefore mentioned. The transverse postapical band in what I take to be the female is not yellow in this form, as it is in the case of the male, but white.

There are four males, one taken at Medje in April and three captured at the same place in August. The two females which I associate with the males because of the markings on the under side of the wings were also captured at Medje, one in July and the other in August.

Whether the forms which I have mentioned in the foregoing paragraphs are all really referable to *Euphædra preussi* and are to be regarded as mere varieties of that insect can only be decided by the test of breeding. They all agree in having on the anterior margin of the hind wing a broad white band extending from the base in cell 7 almost to its outer extremity. This pale band is generally tinged with bluish, but sometimes inclines to greenish or greenish yellow. There is a general resemblance among these insects and, if not varietal forms of the same insect, they represent species which are wonderfully closely related to each other.

(207) 6. **Euphædra inanoides,** new species

Plate XI: Figure 2, ♂, type; Figure 3, ♀, allotype (under side)

On the under side of the wings like *Euphœdra inanum* Butler, but with the white transverse bands not nearly as distinctly defined, especially in the male, and differing on the upper side from *E. inanum* by having the postapical transverse band of the fore wings blue, as in *E. cœrulescens* Grose-Smith, and not pale yellowish white as in

E. inanum, specimens of which I have from Sierra Leone, the type locality. In the female sex the postapical band inclines to whitish or paler blue than in the male sex. On the upper surface this form so closely resembles *E. cærulescens* Sharpe that at first glance it might be mistaken for it, but the bluish median band of the fore wing does not extend as far costad as in *E. cærulescens*, being restricted to a narrow longitudinal stripe bordering the hind margin of this wing, and of course the markings of the lower side of the wings are totally different.

There are eight males, which were taken at Medje (type locality) from June to September, and two females, one captured at Medje in September and another at Bafwaboli on September 10, 1909. The types ♂ and ♀ are in the American Museum of Natural History; paratypes in the Holland Collection in the Carnegie Museum.

(208) 7. **Euphædra afzelii** (Felder)

Romalæosoma afzelii Felder, 1867, Reise Novara, Lep., p. 430.
Euphædra afzelii Aurivillius, 1912, Seitz, Gross-Schmett., XIII, p. 187, Pl. xliii*b*, ♀.

I refer to this species a single male captured at Medje, April 6, 1910. The specimen agrees most nearly with Felder's species, but the reference is doubtful. In view of the great variability of the forms under discussion, I do not care to erect a new species upon a single individual, but it differs almost enough from what I have determined to be typical *E. afzelii* to justify its separation as a valid variety or subspecies.

(209) 8. **Euphædra phaëthusa** (Butler)

Romalæosoma phaëthusa Butler, 1865, Proc. Zool. Soc. London, p. 670, fig. 4.
Euphædra phaëthusa Aurivillius, 1913, Seitz, Gross-Schmett., XIII, p. 188.

There are two specimens of this form, both taken at Medje, one in April, the other in August. It is characterized by the obliteration of the dark markings on the under side of the wings.

(210) 9. **Euphædra ravola** (Hewitson)

Romalæosoma ravola Hewitson, 1864, Exot. Butt., III, *Romalæosoma*, Pl. iv, figs. 19–20.
Euphædra ravola Aurivillius, 1913, Seitz, Gross-Schmett., XIII, p. 188, Pl. xliii*b*.

There are two males and two females which I refer with some uncertainty to this species. They do not agree perfectly with specimens from the western coastal regions of which I have a long suite. They are much brighter green upon the lower side of the wings, and the dark spots and markings are greatly reduced in size imparting to the under side of the wings a different facies from that of typical *E. ravola*. However, I do not think it expedient to bestow a new varietal name upon them. They are from Medje.

(211) 10. **Euphædra rezioides,** new species

Plate XI, Figure 5, ♀

I am constrained to describe as new two females, which it is impossible to refer to any of the hitherto described forms belonging to this group. On the upper side they resemble *E. rezia,* ♀, and have the postapical band narrow and straight as in that species. This band is pale orange in the specimens before me, as is also the case in about half of the females of typical *E. rezia,* the other half, however, in *E. rezia* having this band white. On the under side there is a marked difference. The submarginal spots of the fore wing, which are invariably present in *E. rezia*, are obsolete, except the one near the inner angle. The cell of the hind wing has one or two black spots in it and is closed at its extremity by a black bar, which is not found in *E. rezia*, and beyond the cell in interspaces 3, 4, 5, and 6 there are inwardly pointing sagittate dark spots arranged in a straight series, after which is a transverse series of pale markings; of these the one in space 7 is the longest and immediately follows the longitudinal black streak which partly fills the interspace basad, but does not reach the basal end of this interspace. The other pale spots of the series, which I am describing, diminish rapidly in size in the direction of the lower margin of the wing. The species at first glance recalls the pale spots on the under side of *E. eberti* (cf. Aurivillius, Seitz, XIII, Pl. XLIV*d*), but differs by the existence of the strongly defined dark spots in the cell of the fore wing and the dark markings of the hind wings which have been described. Expanse, 80–85 mm.

The two specimens were both taken at Medje in August. The type is in The American Museum of Natural History. The paratype is in the Holland Collection in the Carnegie Museum.

THEMIS GROUP

(212) 11. **Euphædra adonina** (Hewitson)

Romalæosoma adonina HEWITSON, 1865, Exot. Butt., III, *Romalæosoma*, Pl. III, figs. 11, 12.

Euphædra adonina AURIVILLIUS, 1912, Seitz, Gross-Schmett., XIII, p. 187, Pl. XLIV*b*.

Six males and three females, one male caught at Gamangui in June, the rest at Medje from July to September.

(213) 12. **Euphædra vetusta** (Butler)

Romalæosoma vetusta BUTLER, 1871, Lep. Exot., p. 82, Pl. XXXI, fig. 5, ♀.

Euphædra vetusta AURIVILLIUS, 1912, Seitz, Gross-Schmett., III, p. 187, Pl. XLIV*a*, ♀.

With a measure of hesitation I refer to this species three males taken at Medje in July and August. Butler's figure is that of a female, and so also is that given by Aurivillius. The specimens correspond more nearly with what is known of Butler's species than with any other, and I leave them here subject to query.

(214) 13. **Euphædra gausape** (Butler)

Romalæosoma gausape BUTLER, 1865, Proc. Zool. Soc. London, p. 671, fig. 5.

Euphædra gausape AURIVILLIUS, 1912, Seitz, Gross-Schmett., XIII, p. 186.

There are five males and eleven females before me, not any two of which exactly agree with each other in all respects, but they are so closely related to each other that it seems impossible to separate them. They come nearer to the insect named *E.* (*Romalæosoma*) *gausape* by Butler than to any other form known to me, and I place them here provisionally. The males and females have the postapical band of the fore wing orange in color; in the case of the females it is wider than in the case of the males, and varies somewhat in form and breadth. One female has this band pure white, but otherwise I am unable to distinguish it by its markings from the other females.

The specimens were all taken at Medje, a male and a female in April, the rest in July and August.

Xypete Group

(215) 14. **Euphædra xypete maxima,** new variety

There are three males and three females, which are referable to *Romalæosoma xypete* Hewitson (cf. Exot. Butt., 1865, III, *Romalæosoma*, Pl. II, figs. 8–10), but which differ from specimens in my collection received from Sierra Leone, Cameroon, and Gaboon, in being much larger in size, by the prevalently bluish (not greenish) cast of the lighter portions of their wings on the upper side, and by having the spots which define the inner margin of the postapical band on the under side of the primaries much narrower and less strongly developed than is the case in specimens from the localities named. The form may be designated as var. *maxima*, the specimens averaging fully fifteen per cent more in expanse of wing than specimens taken on the west coast, of which I have many scores before me as I write.

Male type, Medje; female allotype, Ngayu; paratypes, ♂ ♀, Ngayu.

(216) 15. **Euphædra cyanea,** new species

Plate IX: Figure 1, ♂; Figure 2, ♀

Related to *E. cærulescens* Grose-Smith, but differing markedly on both the under and the upper side of both wings. In *E. cærulescens* the basal portion of the fore wing on the upper side is black throughout, except for a few greenish blue scales along the edge of the inner margin. In *E. cyanea* the basal area is bright blue from the base to the middle of the cell and thence outwardly to nearly the inner angle of the wing. Beyond this bright blue area, the outer line of which is quite straight, the remainder of the wing is rich velvety black, interrupted, however, by a sharply defined postapical band of bright blue, which is much more sharply defined than is the case in *E. cærulescens*, and does not extent as far downward toward the inner margin as is the case in the latter species. In *E. cærulescens* this band, which is greenish blue, passing into yellowish toward the costa, reaches vein 2 near the outer border, but in *E. cyanea* the band never extends beyond vein 3. The white spots of the cilia, which are present in both species, differ, being wider in *E. cærulescens*, forming little lunules at the end of the interspaces, but in *E. cyanea* they are mere pointlets, or dots at the middle of the interspaces on the outer margin. The middle of the upper side of the hind wings in *E. cyanea* is bright blue, while in *E. cœrulescens* this area is dull greenish blue. On the under side in *E. cœrulescens* the cell of the fore wing is solidly blue at the base, in *E. cyanea* this region is green or greenish ochraceous. The dark spots in *E. cyanea* which appear in the cell of the fore wing are much smaller than the corresponding spots in the wing of *E. cœrulescens*, and this holds good also of the spots of the hind wings on the under side. Below the red costal band of *E. cœrulescens* (*Vide* Aurivillius, 1912, Seitz, Gross-Schmett., XIII, Pl. XLIV*a*, where the under side of *E. cœrulescens* is shown, in error named *E. gausape*) large dark spots intervene between the red costal band and the rest of the wing. This is not the case in *E. cyanea*. There are no such spots, or they are at most feebly indicated by a faint dark shade near the basal end of interspace 7. The spots in the cell of the secondaries are also very greatly reduced or disappear and the discal spots beyond the cell in *E. cyanea* are smaller and the red of the costal border in some specimens spreads downward into the discal area of the wing, as a faint reddish shade. The females in *E. cyanea* are marked exactly as are the males, but have much greater expanse of wing, and the postapical band of the primaries on the upper side is paler blue. The postapical band of the primaries is less prominent on the under side in both sexes of *E. cyanea* than it is in *E. cœrulescens*, and in some specimens scarcely appears. Expanse, ♂, 60–65 mm.; ♀, 70–85 mm.

Types in The American Museum of Natural History; paratypes in Holland Collection in the Carnegie Museum.

The Expedition brought back fourteen males and five females of this species, which I have carefully compared with a series of male specimens of *E. cœrulescens* which I have in my collection from the lower banks of the Ogové River. The specimens were all captured at Medje, two males in April, the rest from July to September. Two of the males are aberrant in that they show a tendency in the postapical band of the primaries on the upper side to become whitish towards the costa.

(217) 16. **Euphædra karschi** Bartel

Euphædra karschi BARTEL, 1905, Nov. Zool., XII, p. 141. AURIVILLIUS, 1912, Seitz, Gross-Schmett., XIII, p. 186.

The collection contains four males of this well-defined species which were taken at Medje, two in June, one in July, and one in August. The specimens agree perfectly with a series in the possession of the writer, which were collected for him many years ago by Mrs. Reutlinger at Benito, Spanish Guinea.

MEDON GROUP

(218) 17. **Euphædra medon innotata,** new variety

Plate IX, Figure 6, type, ♂

Papilio medon LINNÆUS, 1763, Cent. Ins., p. 19; 1767, Syst. Nat., 12th Ed., p., 753.
Euphædra medon AURIVILLIUS, 1912, Seitz, Gross-Schmett., XIII, p. 184, Pl. XLV*a*.

Euphædra medon is represented in the collection by a series of seven males. All belong to a varietal form, long known to me but not hitherto described, to which I venture to apply the varietal or subspecific name *innotata*.

The form is characterized by being paler on the upper side than typical *E. medon*, the coloration being glaucous and less inclined to greenish than in the typical form, and the dark markings less pronounced, harmonizing more thoroughly with the ground-color of the wings. The differences on the under side are pronounced and may be summed up in the statement that the submarginal spots on both the fore and hind wings are either entirely obliterated or so greatly reduced as to be almost invisible, and the transverse median light band of the hind wing, which is characteristic of the typical form, is either wanting entirely or survives merely as a small light-colored quadrate spot on the costal border.

I have a small series of this form collected upon the Ogové River by the late Dr. A. C. Good, and they have long been standing in my collection awaiting a name. On the under side, because of the suppression of the markings noted above, they are strikingly different from the typical form. The specimens returned by the American Museum Congo Expedition were all taken at Medje in June, July, and August. No other representatives of *E. medon* are in the collection. The type. a male, and several paratypes are in The American Museum of Natural History, paratypes are also in the Holland Collection in the Carnegie Museum.

(219) 18. **Euphædra spatiosa** (Mabille)

Romalæosoma spatiosa MABILLE, 1877, Bull. Soc. Zool. France, I, p. 278.
Euphædra spatiosa AURIVILLIUS, 1912, Seitz, Gross-Schmett., XIII, p. 183, Pl. XLVc.

There are thirty-six males and thirteen females of this species, all taken at Medje, except one male captured at Niangara in November. A few were taken in April, but the majority were caught in June, July, and August, several bearing the later date of September.

(220) 19. **Euphædra losinga** (Hewitson)

Romalæosoma losinga HEWITSON, 1864, Exot. Butt., III, *Romalæosoma*, Pl. I, fig. 5.
Euphædra losinga AURIVILLIUS, 1912, Seitz, Gross-Schmett., XIII, p. 183, Pl. XLV*b*, *c*.

There are two males and two females taken at Medje, one male in April, the rest in July and August 1910.

EURYPHENE Westwood

This is a large genus. There is great dissimilarity between the sexes in many of the species. A clue to the relationship between the males and females is, however, generally found by a close examination of the markings on the under side of the wings. The females in many of the groups are wonderfully alike on the upper surface, and it is only by a careful study of the bandings and markings on the under side of the wings that it is possible to make a correct reference of the females to the corresponding males. Many of the females have not yet been figured in any work, although verbal descriptions of a number of them have been recently given by Dr. Aurivillius in the latest revision of the genus, which is contained in Seitz's 'Gross-Schmetterlinge der Erde,' Vol. XIII.

(221) 1. **Euryphene carshena** Hewitson

Euryphene carshena HEWITSON, 1871, Exot. Butt., IV, *Euryphene*, Pl. VII, figs. 31, 32, ♂. AURIVILLIUS, 1912, Seitz, Gross-Schmett., XIII, p. 171, Pl. XLI*d*, *f*.

This species is characterized in both sexes by the presence on the under side of the wings, above the outer upper angle of the cell of the hind wing, of a broad, very conspicuous brown spot, which shows itself even more conspicuously in the case of the females than in the case of the males.

The collection contains four males; two taken in April and two in September, and four females taken in July and August. All the specimens were captured at Medje.

(222) 2. **Euryphene subtentyris** Strand

Euryphene subtentyris STRAND, 1911, Fauna Exot., I, p. 37; 1912, Archiv f. Naturg., LXXVII, Suppl., 4, p. 118. AURIVILLIUS, 1912, Seitz, Gross-Schmett., XIII, p. 172.

This insect, which may be only a seasonal variety of *E. tentyris* Hewitson, differs from the latter in the entire absence of the brilliant blue-green coloration of the costal area of the fore wing in the male sex. In indirect light there is a faint violet sheen discernible upon the disc of the fore and the hind wings. On the under side of the wings this form is absolutely like typical *tentyris*. We have large numbers of this form collected for us in southern Cameroon.

The species is represented in the Congo Collection by a single male specimen captured at Niangara, November 26, 1910.

(223) 3. **Euryphene abesa** Hewitson

Euryphene abesa HEWITSON, 1869, Trans. Ent. Soc. London, p. 84; 1871, Exot. Butt., IV, *Euryphene*, Pl. VII, figs. 29, 30, ♂. AURIVILLIUS, 1912, Seitz, Gross-Schmett., XIII, p. 172, Pl. XLI*d*, *e*.

This species is represented by a pair caught at Medje on April 6, 1910.

(224) 4. **Euryphene absolon** (Fabricius)

Papilio absolon Fabricius, 1793, Ent. Syst., III, part 1, p. 56.
Euryphene absolon Aurivillius, 1898, Rhop. Æthiop., p. 201, Pl. iii, fig. 5, ♂.

There are six males and one female of this species in the collection. The female was taken at Medje about the middle of August 1910, and two males were likewise captured at the same place, one in May, the other in July. One male was taken at Avakubi, on October 20, 1909, and two males were caught at Niangara in November 1910.

(225) 5. **Euryphene entebiæ** Lathy

Euryphene entebiæ Lathy, 1906, Trans. Ent. Soc. London, p. 5, Pl. ii, fig. 1, ♂. Aurivillius, 1912, Seitz, Gross-Schmett., XIII, p. 172.

Dr. Aurivillius regards this as a varietal form of *E. absolon.* I differ from him, however, for the reason that the female which I associate with the form (the male of which has been very accurately depicted by Lathy) is more like the female of *zonara* than the female of *absolon;* in fact, in my preliminary arrangement of the species I had referred the specimens of the suite before me to *zonara*, marking them as "dark var." Typical *zonara* from the west coast of Africa is a somewhat smaller insect, the prevalent color of the upper side of the wings being bright reddish fulvous. The specimens of *E. entebiæ* before me are most of them larger than typical *zonara*, much darker in color, warm brown, banded with very dark brown, almost black, and they are all absolutely alike on the under side in having on the hind wings on either side of vein 6, just beyond the upper outer angle of the cell, a dark shade, accentuated, as is well shown in Lathy's excellent figure, by two small light points, arranged vertically, one on either side of vein 6. The solitary female before me has a dark shade located at exactly the same spot, with indications of the lighter points. If designated as a variety of any of the well-known species already described, it seems to me it should be of *zonara* rather than of *absolon.* For the present I recognize it as a distinct species.

The specimens vary a little in size. Held in a very oblique position, they reveal a very slightly purplish blue iridescence, in this respect being somewhat like *E. absolon* var. *micans* Aurivillius, though in the latter the blue iridescence is much more evident.

The collection contains twelve males and one female, which were all taken at Medje, the dates of capture including the months of April, July, August, and September.

(226) 6. **Euryphene zonara** (Butler)

Aterica zonara BUTLER, 1871, Proc. Zool. Soc. London, p. 81; 1871, Lep. Exot., p. 72, Pl. XXVIII, figs. 1, 2.

There are three males, all taken at Medje, one in April, the other two in September, and one female caught in the month of July. The figure of the under side of the wings of a male given by Aurivillius in his 'Rhopalocera Æthiopica,' Pl. III, is that of a specimen in which the characteristic markings are not as strongly accentuated as in the specimens upon which I am reporting.

(227) 7. **Euryphene lucasi,** new species

Plate IX: Figure 4, ♂, type; Figure 5, ♀, allotype

♂. Upper side of both wings reddish fulvous marked with bands and spots of dark brown. FORE WING: a dark spot filling the base of the cell, succeeded by a narrow angulated line, which in turn is followed by a large spot having the outline of the figure 8, succeeded by a second narrow angulated line, and this in turn followed at the end of the cell by a large spot, which has its inner margin straight, but is sinuate on its outer margin; below the cell the basal area as far as the first mesial outer band of light spots is dark brown; the dark spot at the end of the cell and the dark area below the cell are succeeded by a mesial band of light spots, which, beginning on the costa beyond the end of the cell, runs first transversely toward the outer margin as far as vein 6, then turns abruptly and sweeps backward and downward to the inner margin of the wing which it reaches less than half its distance from the base. Beyond this series of light spots is a series of dark subquadrate spots gradually increasing in width from the costa as far as the first submedian nervule, and then rapidly diminishing toward the inner margin. This band is succeeded by a series of light lunate spots convex basad as far as vein two, and continued to the inner margin in a narrow curved line parallel to the line of the lower part of the first median series of light spots. This last line of light spots is followed by a series of subcircular dark spots on the interspaces extending from vein 6 to vein 1, below which the last spot of the series is quadrate. Beyond these spots there is another series of light sublunate spots convex marginad. The effect of the arrangement of the last-mentioned two series of light lines with their reversed curvatures is to produce the appearance of eyelike markings, with a dark pupil partly surrounded by red. The marginal border of the wing is dark, but not as dark as the inner series of dark bands and spots. At the apical extremity of the wing there is a general dark suffusion in which the spots and bands lose themselves. The cilia are dark brown, checkered at the middle of each interspace with white. HIND WING: fuscous on the inner margin, with the area below the cell for a short distance, and the base of the cell dark brown; the middle of the cell is reddish, marked with a figure 8 and a thin dark line at its end, both darker; beyond the cell is a dark shade or band, interrupted by a mesial band of bright reddish brown, which, beginning as a point in interspace 7, rapidly widens to vein 1, where it ends abruptly. The two bands of light lines enclosing circular dark spots, found on the primaries, are continued upon the secondaries and the marginal borders and cilia of the latter are much as on the former. The head, thorax, and abdomen are blackish above, as are the palpi; on the lower side they are grayish. The under side of both wings is pale gray, and all the markings of the upper side are reproduced with modifications, most of them being greatly reduced in size, and those of the cells and the discal areas being pale but sharply defined externally by fine dark lines.

♀. The female is larger than the male, as is always the case in this genus, and has greater expanse of wing. The arrangement of the spots and lines is substantially the same as in the male sex, with this difference that the light red spots of the upper side are prevalently light gray, except the inner mesial and the two succeeding series of light spots, which in this sex are light lemon-yellow, and the former of which on the secondaries is greatly expanded, forming a large diffuse yellow band occupying the middle of the wing. On the under side the markings near the end of the cell are compacted to form a very irregular dark band sharply defined externally, and having as one of its characteristic marks a narrow projection at the origin of the second and third submedian nervules. This is also to be detected in the male sex, and is a clue to the relationship of the two sexes. Expanse: ♂, 50–55 mm.; ♀, 60–65 mm.

Types in The American Museum of Natural History; paratypes in the Holland Collection in the Carnegie Museum.

The species may easily be distinguished from all hitherto described by the narrow band of light yellow spots which crosses the primaries of the female, as stated in the description, and which corresponds in its location to the inner band of fulvous spots in the male.

I take pleasure in naming this species in honor of my friend of many years, Dr. F. A. Lucas, the Director of The American Museum of Natural History.

The collection before me contains three males and three females, all captured at Medje, one female in April, the rest from June to September.

(228) 8. **Euryphene mandinga** Felder

Euryphene mandinga FELDER, 1860, Wien. Ent. Monatschr., IV, p. 108. AURIVILLIUS, 1898, Rhop. Æthiop., p. 201, Pl. III, fig. 7, ♂.

Of this well known species there are four males and three females, all taken at Medje in August, except one female taken on September 1, 1910.

(229) 9. **Euryphene oxione** Hewitson

Euryphene oxione HEWITSON, 1866, Exot. Butt., III, *Euryphene*, Pl. V, text; 1871, *loc. cit.*, IV, *Euryphene*, Pl. VIII, figs. 36, 37, ♂. DEWITZ, 1866, Berl. Ent. Zeit., XXX, Pl. VII, figs. 1, 2, ♀. AURIVILLIUS, 1912, Seitz, Gross-Schmett., XIII, p. 172, Pl. XLIc.

The collection contains two males and five females of this well-marked species, all taken at Medje, the dates of capture including the months of April, June, August, and September.

(230) 10. **Euryphene partita** Aurivillius

Euryphene partita Aurivillius, 1895, Ent. Nachr., XXI, p. 380.
Euryphene aurivillii Staudinger, 1896, Iris, VIII, p. 371, Pl. viii, fig. 3, ♂.
Euryphene partita Aurivillius, 1912, Seitz, Gross-Schmett., XIII, p. 172, Pl. xlic, ♀.

Of this easily recognized species the collection contains four males and eleven females, all taken at Medje, a couple of females captured in April, and all the remainder taken in the months of July and August.

It may be worthy of note that the two females captured in April differ from the females taken later in the year in that they are without the bluish iridescence which is found upon the fore wings of the latter, indicating a seasonal variation in this respect.

(231) 11. **Euryphene iturina** Karsch

Euryphene iturina Karsch, 1894, Ent. Nachr., XX, p. 215. Aurivillius, 1898, Rhop. Æthiop., p. 200, Pl. iii, fig. 1, ♀; 1912, Seitz, Gross-Schmett., XIII, p. 173, Pl. xli*b*, ♂, ♀.

The collection contains twenty-two males and seventeen females. The specimens were all taken at Medje, except two males which are ticketted as captured at Gamangui in June. The labels attached to the specimens taken at Medje show that a few were captured in April, but by far the greater number were taken in August and September.

(232) 12. **Euryphene fulgurata** Aurivillius

Plate X, Figure 11, ♀

Euryphene fulgurata Aurivillius, 1904, Ent. Tidskr., XXV, p. 95, fig. 35; 1912, Seitz, Gross-Schmett., XIII, p. 173.

Two females taken at Medje, one in July, the other in August.

(233) 13. **Euryphene congolensis** Capronnier

Euryphene congolensis Capronnier, 1889, Ann. Soc. Ent. Belgique, XXXIII, Bull., p. cxxii. Aurivillius, 1898, Rhop. Æthiop., p. 200, Pl. iii, figs. 8, 9, ♂, ♀.

This species is represented in the collection by thirty-five males and thirty-three females, all of which appear to have been taken at Medje, except one female caught at Stanleyville on August 18, 1909, and two females taken at Gamangui on June 17, 1910. The dates attached to the specimens captured at Medje show that a few were caught in April, but the great majority were taken in the months of July, August, and September.

(234) 14. **Euryphene phranza** Hewitson

Euryphene phranza Hewitson, 1865, Exot. Butt., III, *Euryphene*, Pl. ii, figs. 7, 8. Aurivillius, 1912, Seitz, Gross-Schmett., XIII, p. 173, Pl. xli*b*.

This species is represented by a male and female, the former captured at Medje on May 25, the latter taken at the same place on June 21.

(235) 15. **Euryphene severini** Aurivillius

Euryphene severini Aurivillius, 1897, Öfvers. Sv. Vet.-Akad. Förh., LIV, part 1, p. 280, fig. 2, ♀; 1898, Rhop. Æthiop., p. 200, Pl. iii, fig. 10, ♂.

Of this species there are thirteen males, all labelled as captured at Medje in June, July, and August. With these males I associate five females, taken at Medje in the same months, which agree almost absolutely with the figure of this sex given by Aurivillius (*loc. cit.*), save that in the specimens before me the apex of the fore wing is somewhat more pointed and not of precisely the shape given in the wood cut supplied by Aurivillius. I can see no difference in other respects; the markings are identical and, in spite of the fact that the fore wing of these females is somewhat more like the female of *E. sophus* in showing a tendency to become falcate at the tip, I am reasonably certain that my reference is correct. It is to be observed that, while the fore wings are, as I have said, falcate, they are rounded at the extreme apex and not sharply acuminate as in *sophus*.

(236) 16. **Euryphene lætitia** Plœtz

Euryphene lætitia Plœtz, 1880, Stett. Ent. Zeit., XLI, p. 192. Aurivillius, 1898, Rhop. Æthiop., p. 200, Pl. ii, fig. 2; 1912, Seitz, Gross-Schmett., XIII, p. 174, Pl. xlic, ♂, ♀.

I refer to this species two males taken at Medje on May 6, 1910. While agreeing pretty thoroughly on the upper side with the figure of the male given by Aurivillius, there are some minor discrepancies on the under side of the wing but, without more material before me, I do not feel justified in differentiating the insect from *E. lætitia*, with which it agrees more closely than with any other species hitherto described.

In passing, I must call attention to the fact that Dr. Aurivillius is quite in error in sinking my *E. castanea* (cf. Canadian Entomologist, 1893, XXV, p. 1) as a synonym of *E. lætitia*. It is totally distinct and, had Dr. Aurivillius known it other than by the verbal description I published, he would not have included it under *E. lætitia*.

(237) 17. **Euryphene sophus** (Fabricius)

Papilio sophus Fabricius, 1793, Ent. Syst., III, part 1, p. 46.
Euryphene sophus Aurivillius, 1912, Seitz, Gross-Schmett., XIII, p. 174, Pl. xlic.

Two males and two females captured at Medje are referable to this species. One of the males was caught on August 1, the other on September 27. One of the females was taken on August 13, the other on July 29. The latter female, which has the pre-apical band white, is referable to the varietal form named *phreone* Feisthamel. Except for the difference in the color of the transverse postapical band there is no difference whatever between this form and true *E. sophus* (Fabricius).

(238) 18. **Euryphene phantasia** Hewitson

Euryphene phantasia HEWITSON, 1865, Exot. Butt., III, *Euryphene*, Pl. II, figs. 9-11. AURIVILLIUS, 1912, Seitz, Gross-Schmett., XIII, p. 176, Pl. XLI*a*.

Three males and three females. One female which has the post-apical band of the primaries yellowish instead of white, as is the case with the other two, was taken at Ngayu in December, 1909. All the other specimens were captured at Medje, one male in April, the rest in July and August.

(239) 19. **Euryphene flaminia** Staudinger

Euryphene flaminia STAUDINGER, 1891, Iris, IV, p. 110, Pl. I, fig. 4. AURIVILLIUS, 1912, Seitz, Gross-Schmett., XIII, p. 176, Pl. XL*e*.

I refer to this species two males and a female taken at Medje, the female in April, the males in July and August.

(240) 20. **Euryphene maximiniana** Staudinger

Plate VII, Figure 10, ♀

Euryphene maximiniana STAUDINGER, 1891, Iris, IV, p. 112. AURIVILLIUS, 1912, Seitz, Gross-Schmett., XIII, p. 176.

Four males and three females are referable to this species, which hitherto has only been reported from Cameroon. Six specimens were taken at Medje in June, July, and August, and one at Gamangui.

(241) 21. **Euryphene mardania** (Fabricius)

Papilio mardania FABRICIUS, 1793, Ent. Syst., III, part 1, p. 249.

Euryphene mardania AURIVILLIUS, 1912, Seitz, Gross-Schmett., XIII, p. 177, Pl. XL*c*, *d*.

Of this common species there are six males and four females. Two of the males and one of the females were taken at Medje in July and August, the rest were captured at Niangara in November 1910.

(242) 22. **Euryphene plistonax** Hewitson

Euryphene plistonax HEWITSON, 1874, Exot. Butt., V, *Euryphene*, Pl. IX, figs. 38, 39. AURIVILLIUS, 1912, Seitz, Gross-Schmett., XIII, p. 177, Pl. XL*c*.

Of this large and striking species there are two males and five females taken at Medje, the dates of capture ranging from June to August.

(243) 23. **Euryphene barce** (Doubleday)

Aterica barce Doubleday, 1847, Proc. Zool. Soc. London, p. 59.
Euryphene lesbonax Hewitson, 1864, Exot. Butt., III, *Euryphene*, Pl. i, figs. 5, 6, ♂.
Euryphene barce var. *achillæna* Bartel, Aurivillius, 1912, Seitz, Gross-Schmett., XIII, p. 179, Pl. xl*b*, ♀.

This species is represented in the collection by a single female, belonging to the varietal form named *achillæna* by Bartel. It was caught at Medje, May 6, 1910.

(244) 24. **Euryphene chloëropis** Bethune-Baker

Euryphene chloëropis Bethune-Baker, 1908, Ann. Mag. Nat. Hist., (8) II, p. 474. Aurivillius, 1912, Seitz, Gross-Schmett., XIII, p. 178.

I refer a single male captured at Medje in the early part of April to this species, with the description of which it appears to agree very closely, except in the expanse of wing. Baker records 72 mm. for the spread of the specimen he described, while the individual before me has a spread of only 58 mm.

(245) 25. **Euryphene luteola** Bethune-Baker

Euryphene luteola Bethune-Baker, 1908, Ann. Mag. Nat. Hist., (8) II, p. 474. Aurivillius, 1912, Seitz, Gross-Schmett., XIII, p. 179.

There are two males which agree very closely with the description given by Bethune-Baker and which I accordingly refer to this species. There are also two females which appear to me to be undoubtedly that sex of this species. As the female of *E. luteola* awaits description, I may briefly point out that, as is always the case in this genus, they exceed the males in expanse of wing. The prevalent colors of the wings are paler on the upper side, the light areas inclining to blue and not to green as in the male. On the under side both wings are pale reddish brown, the base of the costal margin blue as in the male, and the other spots and markings as in the male but more diffuse and expanded. As in the species listed just before this, there is a discrepancy in the matter of the expanse of wing between the individuals before me and the male described by the author of the species. Bethune-Baker gives 77 mm. as the expanse, but the two males before me measure not more than 57 mm., while the females have a spread of from 68 to 70 mm.

The specimens are from Medje.

(246) 26. **Euryphene rubrocostata** Aurivillius

Euryphene rubrocostata Aurivillius, 1897, Öfvers. Sv. Vet.-Akad. Förh., LIV, 5, p. 279, fig. 1, ♀; 1898, Rhop. Æthiop., p. 197, Pl. ii, fig. 5, ♂.

The collection contains fifty males and four females, all taken at Medje, a couple in April, and all the rest including all the females, from July to September.

DIESTOGYNA Karsch

(247) 1. **Diestogyna camarensis** (Ward)

Euryphene camarensis WARD, 1871, Ent. Mo. Mag., VIII, p. 35.
Diestogyna camarensis AURIVILLIUS, 1912, Seitz, Gross-Schmett., XIII, p. 159, Pl. XXXIX*d*.

A single male taken at Medje, in September 1910.

(248) 2. **Diestogyna goniogramma** Karsch

Diestogyna goniogramma KARSCH, 1894, Berl. Ent. Zeit., XXXIX, p. 5, fig. 1. AURIVILLIUS, 1912, Seitz, Gross-Schmett., XIII, p. 160, Pl. XXXIX*d*.

Of this species there are thirteen males and four females, all taken at Medje, a pair in April, all the rest from July to September.

(249) 3. **Diestogyna mawamba** Bethune-Baker

Diestogyna mawamba BETHUNE-BAKER, 1908, Ann. Mag. Nat. Hist., (8) II, p. 476. AURIVILLIUS, 1912, Seitz, Gross-Schmett., XIII, p. 163, Pl. XXXVIII*e*.

To this comparatively recently described species I refer a male taken at Medje on August 11, 1910 and a female taken at the same place on July 17, 1910. While the specimens slightly differ from the description given by Bethune-Baker, they nevertheless agree so thoroughly with the figures given by Aurivillius that I think I am right in my determination.

(250) 4. **Diestogyna tadema** (Hewitson)

Aterica tadema HEWITSON, 1866, Exot. Butt., III, Pl. *Aterica* and *Harma*, figs. 10–12, ♂, ♀.

I refer to this species a male taken at Medje, on August 1, and a female taken on July 21, 1910.

(251) 5. **Diestogyna saphirina** Karsch

Diestogyna saphirina KARSCH, 1894, Ent. Nachr., XX, p. 220. AURIVILLIUS, 1912, Seitz, Gross-Schmett., XIII, p. 166, Pl. XXXVII*f*.

I refer to this species a series of eighteen males and fourteen females, taken at Medje, a few in April, the rest from July to September.

(252) 6. **Diestogyna melanops** Aurivillius

Diestogyna melanops AURIVILLIUS, 1897, Öfvers. Sv. Vet.-Akad. Förh., LIV, 5, p. 282; 1912, Seitz, Gross-Schmett., XIII, p. 168, Pl. XXXVII*e*.

This species is represented in the collection by three males, all taken at Medje, one in April, one in August, and one in September.

(253) 7. **Diestogyna doriclea infusca** (Capronnier)

Euriphene (*sic*) *infusca* CAPRONNIER, 1889, Ann. Soc. Ent. Belgique, XXXIII, Bull., p. cxlv.

Diestogyna doriclea infusca AURIVILLIUS, 1912, Seitz, Gross-Schmett., XIII, p. 168.

This variety of *D. doriclea* (Drury) (cf. Ill. Exot. Ent., 1782, III, p. 50, Pl. xxxvi, figs. 5, 6), which occurs sporadically in collections which we have received from the tropical western coast, appears to be, as Aurivillius has already pointed out, the dominant form in the interior of the Congo Basin. It is represented in the collection by eight males and two females, all taken at Medje, a couple in April, the rest in August and September 1910.

(254) 8. **Diestogyna amaranta** Karsch

Diestogyna amaranta KARSCH, 1894, Berl. Ent. Zeit., XIX, p. 6, fig. 2. AURIVILLIUS, 1912, Seitz, Gross-Schmett., XIII, p. 169, Pl. xxxviii*f*.

There are two males of this species which agree perfectly with the figure and description given by Karsch. They were both captured at Medje in September 1910.

(255) 9. **Diestogyna gambiæ** (Feisthamel)

Euryphene gambiæ FEISTHAMEL, 1850, Ann. Soc. Ent. France, (2) VIII, p. 251, Pl. ix, fig. 2.

Diestogyna gambiæ AURIVILLIUS, 1912, Seitz, Gross-Schmett., XIII, p. 169, Pl. xxxvii*a*.

Of this well-known and widely distributed species there are eight males and nine females, all taken at Medje, a pair in April, the rest in August 1910.

(256) 10. **Diestogyna atossa** (Hewitson)

Euryphene atossa HEWITSON, 1865, Exot. Butt., III, *Euryphene*, Pl. iii, figs. 1, 2, ♀.

Aterica amaxia HEWITSON, 1865, Exot. Butt., III, *Aterica* and *Euryphene*, Pl. vi, figs. 8, 9, ♀.

Diestogyna atossa AURIVILLIUS, 1912, Seitz, Gross-Schmett., XIII, p. 169, Pl. xxxvii*a*, *b*.

Of this familiar species there are five males and three females, all taken at Medje in August and September.

In addition to the ten foregoing species which are referable to forms already known and described, I find in the collection two specimens which have given me a good deal of trouble and which I can not refer to any species the descriptions and figures of which are known to me.

They belong apparently to what Dr. Aurivillius designates as his "Second Group" in this great genus. While I dislike very much to found a specific description upon single individuals, I nevertheless am constrained to do so in this case, as the insects are so evidently distinct from all other forms which have been described.

(257) 11. **Diestogyna kahli,** new species

Plate XII, Figure 13, ♂

♂. Closely allied to *D. amaranta* Karsch, but having the hind wing somewhat narrower than in the species described by Karsch, and differing totally in the distribution and shade of the blue color on the upper side of the wings. In *D. amaranta* the blue color is evenly distributed over the entire surface of the fore wing and shows in certain lights a tendency to play into green. In *D. kahli* the blue of the wings on the upper side is deep pavonine blue, or intense cobalt, confined on the anterior wing to a broad patch above the lower margin near the lower angle, and not invading the cell; the cell and the remainder of the wing being dark velvety brown. There is also in the type no indication of the presence of the small subapical pale dots which are shown in the figure given by Karsch as characterizing his species. On the under side of the wings there is a resemblance in the markings to those of *amaranta* Karsch, and *mawamba* Bethune-Baker, but in *D. kahli* the outer area of the fore wing is much lighter and is sharply contrasted with the darker basal area which sends forth tooth-like projections in a regular series on each nervule from the costa to vein 2. The hind wing is marked very much as in *amaranta*, but is richer and redder in tone, the basal and inner areas being laved with dark maroon. The fringes of both the fore and the hind wings are narrowly pure white on the upper sides, not so conspicuous on the lower side. In *D. amaranta* Karsch the white border of the hind wing seems to be restricted to small white dots at the middle of each interspace. Expanse, 45 mm.

The type, which is unique, was taken at Medje and is in The American Museum of Natural History.

I take pleasure in naming this beautiful species after my friend and associate, Mr. Hugo Kahl, who has assisted me in arranging the collection upon which I am reporting.

(258) 12. **Diestogyna rotundata,** new species

Plate XII, Figure 14, ♂

♂. This species in the matter of form is distinguished by the relatively great expanse of the hind wings, which, in their rounded outline and breadth, suggest the outlines of the females of this genus, rather than the males. The species in the outline of the wings comes nearer *D. tadema* in this respect, but the wings are relatively much broader and more fully rounded in outline than is the case even in that species. The wings on the upper side are brown, shot with pale lilacine blue over most of the surface of the primaries and upon the inner half of the secondaries, which have the costal area very broadly pale brown, shading on the costal margin into pale fuscous. The inner margin, as far as vein 1, is also fuscous. In the fore wings there are the usual dark transverse markings in the cell. An obscure dark band runs from the costa to the end of the cell outwardly and downwardly to near the lower angle of the cell, and then passes perpendicularly downward toward the inner margin, which it does not reach, being lost in the general ground-color of the wing. This dark band is followed outwardly by a paler bluish band succeeded by a dark shade extending from the costa toward the inner margin. Beyond this there are five or six light points, one on each interspace, these points are succeeded externally by a series of dark quadrate spots on the interspaces. There is a deep, dark brown submarginal band running evenly from just before the apex to the lower angle of the wing. The fringes are concolorous. The hind wing on the upper side is traversed by three bands of darker color, which are most strongly accentuated on the inner half of the wing and which fade out toward the costal area. The dark submarginal band which is found on the primaries reappears upon the secondaries, being most intense opposite the end of the cell. The wings on the lower side are pale reddish brown, variegated with darker brown spots and bands. The fore wings are paler in color than the hind wings; the basal area is pale chestnut-brown with an oval brown spot near the base of the cell and two transverse, quite broad, dark spots, one near the middle of the cell and the other at its end. All of these spots in the cell are defined outwardly by very narrow pale lines. A very pale light transverse band marks the division between the darker basal area and the lighter outer area of the wing. The series of small light-colored points near the apex of the wing on the upper side reappear on the lower side, where they are much more distinct than on the upper side, and are accentuated externally by deep brown shades. The submarginal band of the upper side appears quite faintly on the lower side, and the outer margin from vein 2 to vein 7 is laved with dark chestnut-brown.

The hind wings on the lower side have the basal area darker than is the case in the fore wing, and are distinctly defined externally by a band of pale lilac. There is a minute dark spot in the middle of the cell, pupiled with lighter color and surrounded by yellowish scales. The outer half of the hind wing is more or less deep chestnut-brown, with a regular evenly curved row of six sharply defined white spots located at the middle of the interspaces from just behind the costa, terminating before vein 2. The submarginal dark band of the secondaries reappears on the lower side in a series of dark lunulate markings parallel to the outer border but not quite reaching the inner border.

The palpi on the upper side are dark, on the lower side pale brown. The thorax and the abdomen on the lower side are pale brownish white; on the upper side they are dark brown.

The lower side of the wings recalls in some respects the markings of the under side of the species named *umbrina* by Aurivillius, but in the outline of the wings, the color and shape of the markings, it is very different, and assuming that the figure of the species given by Aurivillius in Seitz's work is adequate, I cannot reconcile myself at all to refer the insect before me to that species. Expanse, 53 mm.

The type, which is unique, was taken at Medje. It is deposited in The American Museum of Natural History.

Euryphura Staudinger

This genus is but poorly represented in the collection, as is usually the case, for the insects do not appear to be common. It is a difficult genus, both because of the dissimilarity of the sexes and the variability of the females, which are polymorphic in some species.

(259) 1. **Euryphura achlys** (Hopffer)

Harma achlys HOPFFER, 1862, Peters, Reise n. Mossambique, Ins., p. 390, Pl. XXII, figs. 5, 6.

There is one female, taken at Niangara in November, which agrees well with the figure given by Hopffer, and with specimens in my collection from Zanzibar.

(260) 2. **Euryphura chalcis** (Felder)

Harma chalcis FELDER, 1860, Wien. Ent. Monatschr., IV, p. 234.
Euryphura chalcis AURIVILLIUS, 1912, Seitz, Gross-Schmett., XIII, p. 157, Pl. XXXVI*d*.

To this species I refer four males and an aberrant female. One male and the female were taken at Medje in August, the other three males were captured at Niangara in November.

(261) 3. **Euryphura plautilla albofasciata** Staudinger

Euryphura albofasciata STAUDINGER, 1896, Iris, IX, p. 213.

I refer to this form a single female taken at Bafwabaka, January 7, 1910. It agrees quite thoroughly with the description given by Staudinger.

CYMOTHOË Hübner

The genus *Cymothoë* is characteristic of the hot, wooded lands of the Ethiopian subregion, to which it is confined. It offers a number of difficulties to the student because of the great dissimilarity of the sexes in most of the species and the further fact that many species in the female sex are known to be polymorphic. Until the test of breeding the various species shall have been made, there will necessarily remain a measure of uncertainty as to the true relationship of various forms, some of which have been already named and described in one or the other sex and some of which prudent students have been holding in the hope of obtaining more light.

The genus is rich in species, some of which are among the most beautiful insects found in the region they inhabit. The American Museum Congo Expedition returned good series of a number of the commoner forms and, in addition, three species which I believe hitherto undescribed, the males of *C. angulifascia* Aurivillius and of *C. aramis* (Hewitson), of which hitherto only the females have been known, and other material which helps to confirm conclusions, already reached by the writer with the help of collections made for him in other parts of the general region, which in some respects are at variance with the published opinions of some of his friends, among them Dr. Aurivillius, who has given us in Seitz, 'Gross-Schmetterlinge', Vol. XIII, the latest revision of the genus. These things will be touched upon in what I shall have to say in regard to the several species in the following pages.

(262) 1. **Cymothoë theobene** (Doubleday and Hewitson)

Harma theobene Doubleday and Hewitson, 1850, Gen. Diurn. Lep., II, Pl. xl, fig. 3.
Cymothoë theobene Aurivillius, 1912, Seitz, Gross-Schmett., XIII, p. 144, Pl. xxxiv*d*.

There are one hundred males and twenty-four females of this species in the collection. Most of them were taken at Medje, a few in April, the rest from June to October. A number are from Niangara, captured in November, and there are other individuals labelled as coming from Ngayu, Gamangui, and Munie Katoto.

This is one of the commonest species of the genus, and almost every collection from tropical Africa contains at least a few examples. There is considerable variation in the size and marking of individuals, especially in the case of the females. I find, however, no female as large and as darkly colored as some I have from the Ogové River, the outer third of the wings in these specimens from the Congo being paler and the dark spots smaller in size than is the case with the material from nearer the western coast. There are several male specimens from Niangara and one from Medje which come near to the form named *C. blassi* by Weymer in which the transverse light band on the primaries of the males is not sharply defined outwardly near the costa but fades insensibly into the general ground-color. The form is scarcely worthy of a varietal name, though it can easily be discriminated and, in fact, is the prevalent form on the eastern coast, whence I received a series some years ago, which were collected for me by the late William Doherty on the hills back of Mombasa.

(263) 2. **Cymothoë reinholdi** (Plœtz)

Harma reinholdi Plœtz, 1880, Stett. Ent. Zeit., XLI, p. 194 (♂).
Cymothoë reinholdii Aurivillius, 1894, Ent. Tidskr., XV, p. 305 (♀); 1898, Rhop. Æthiop., p. 211, Pl. iv, figs. 6, 7 (♂ and ♀).

There are three males and one female, all taken at Medje, a pair in July and two males in August.

(264) 3. **Cymothoë theodosia** Staudinger

Cymothoë theodosia Staudinger, 1889, Stett. Ent. Zeit., L, p. 416. Aurivillius, 1912, Seitz, Gross-Schmett., XIII, p. 146, Pl. xxxvi*a*, ♀.

Of this beautiful insect, stated by Staudinger to be a local race of *C. beckeri* Herrich-Schæffer, there are thirty-two males and eleven females. They were all taken at Medje, except a pair caught at Munie Katoto and a male taken at Risimu in September 1909. One rather dwarfed specimen is recorded as taken in April, the rest from July to September, but by far the larger number in the month of August. The insect is not a race of *C. beckeri* Herrich-Schæffer, but undoubtedly a valid species.

(265) 4. **Cymothoë confusa** Aurivillius

Cymothoë confusa Aurivillius, 1887, Öfvers. Sv. Vet.-Akad. Förh., XLIV, p. 310; 1912, Seitz, Gross-Schmett., p. 146, Pls. xxxiv*a*, *b*, and xxxvi*a*.

One male taken at Niangara, November 20, 1910.

(266) 5. **Cymothoë colmanti** Aurivillius

Cymothoë colmanti Aurivillius, 1898, Ent. Tidskr., XIX, p. 180, fig. 6; 1912, Seitz, Gross-Schmett., XIII, p. 147.

A single male captured at Gamangui, February 4, 1910, is referred to this species. It corresponds very closely to the description and figure given by Aurivillius, and the very slight differences may be due to the fact that the specimen is a trifle worn and the marginal borders of the wings are not quite as distinctly marked as in the published figure.

(267) 6. **Cymothoë cyclades** (Ward)

Plate VII, Figure 6, ♂

Harma cyclades Ward, 1871, Ent. Mo. Mag., VIII, p. 119; 1874, Afr. Lep., p. 14, Pl. xi, figs. 4, 5.

Cymothoë cyclades Aurivillius, 1912, Seitz, Gross-Schmett., XIII, p. 147, Pl. xxxiv*b*, ♂.

One male taken at Medje, July 8, 1910. I refer this specimen to Ward's species in spite of some minor, apparently individual, differences. It agrees very closely with specimens which I have from the tropical western coast and which I do not hesitate to identify with *C. cyclades*.

(268) 7. **Cymothoë diphyia** Karsch

Plate VI, Figure 6, ♀

Cymothoë diphyia Karsch, 1894, Ent. Nachr., XX, p. 211. Aurivillius, 1912, Seitz, Gross-Schmett., XIII, p. 149, Pl. xxxv*a*, ♂.

Ten males caught at Medje, one in April, the rest in July and August, and one female, which I believe I am right in associating with the males, though it does not quite agree with the brief characterization of the female given by Aurivillius (*loc. cit.*). As no figure of the female of *C. diphyia* has thus far been published and all we know about that sex is contained in the couple of lines printed by Aurivillius, it seems to me fitting that I should give a figure of the insect which I have determined to be the female of this species. The female assigned to *C. diphyia* by Karsch is unmistakably the female of *C. theodosia*, as has already been pointed out by Aurivillius. The species is closely related to *C. fumana* (Westwood). It differs in the male sex in having the outer third of the fore wing on the upper side tinged with ochreous (in *C. fumana* the apical third is creamy white) and in having the outline of the dark inner basal area of the fore wing straight or concave costad, while in *C. fumana* this area is strongly convex on the margin toward the costa.

(269) 8. **Cymothoë herminia** Grose-Smith

Plate VIII: Figure 1, ♂; Figure 4, ♀

Cymothoë herminia Grose-Smith, 1887, Ann. Mag. Nat. Hist., (5) XIX, p. 63. Aurivillius, 1912, Seitz, Gross-Schmett., XIII, p. 149, Pl. xxxv*a*, ♂.

There are eighteen males of this species, all taken at Medje in July and August. With these I associate a female, which I believe to be that sex of the species, and which I cause to be figured, as no description or figure of the female has heretofore been published.

(270) 8*a*. **Cymothoë herminia poënsis,** new variety

Plate VIII, Figure 2, ♂

All the specimens of *C. herminia* taken by the American Museum Congo Expedition conform to the figures and descriptions of this species, which have been published by Grose-Smith and by Aurivillius, and are typical, having the dark band which outwardly defines the pale middle band of the primaries incomplete at its upper extremity, thus leaving the costal margin broadly of the same color as the middle of the wing, except at the tip, on which the outer marginal border is continued. There is, however, in my possession a male specimen of this species which was taken on Fernando Po for me by the late Dr. A. C. Good, in which the black band above mentioned extends all the way to the costa, and in which the dark submarginal markings are heavier than in the specimens from the Congo upon which I am reporting. To this varietal (insular) form I propose to give the name *poënsis*, and take the opportunity to figure it. Type in Holland Collection, Carnegie Museum.

(271) 9. **Cymothoë langi,** new species

Plate VIII: Figure 7, ♂; Figure 8, ♀

♂. This species, which is closely allied to *C. weymeri*, *C. staudingeri*, and *C. johnstoni*, is easily distinguished from all of them by the fact that the light sagittate markings which cap internally the black dart-shaped submarginal spots on the interspaces are entirely suppressed on the hind wings, and also on the fore wings except in space 2, where the lower limb of one of these markings survives as a narrow line pointing downwardly and outwardly, and on space 5, where there is an oblong light spot, slightly bifid at its outer extremity, and on space 6, where there is a faint linear streak of lighter scales on the dark ground of the broad outer margin. On the under side the mesial white band, which is much whiter than on the upper side, is narrower. and tapers from the costa of the fore wing to nearly the anal angle of the hind wing, being sharply defined outwardly by a thin almost straight dark line. Expanse, 60–63 mm.

♀. With the males I associate, I believe correctly, a female, which rather closely resembles that sex of *C. hewitsoni* Staudinger. It differs from *C. hewitsoni* ♀ in not having the white bar at the outer end of the cell of the fore wing and in not having the small black bar which occurs in *C. hewitsoni* at the end of the cell of the hind wing. On the under side a difference presents itself in the fact that the inner dark area is defined outwardly by a straight line in *C. langi*, while in *C. hewitsoni* it is inwardly curved or concave on the secondaries, and at the point where this dark area terminates abruptly on the lighter ground of the fore wings in *C. hewitsoni* there is in *C. langi* a thin dark line, which extends forward until it reaches the costal margin, about one-third of the distance from the apex of the fore wing. Expanse: ♂, 60 mm.; ♀, 70 mm.

The type ♂, and allotype ♀, are in The American Museum of Natural History, together with a number of male paratypes. There are also several male paratypes in the Holland Collection in the Carnegie Museum. Type locality, Medje.

The American Museum Congo Expedition took eleven males and the single female above described, one male having been captured at Gamangui in June, the female, which is the allotype, at Medje in June, and all the other specimens at the latter place in July and August. We also have two males taken by Mr. A. I. Good at Lolodorf, Cameroon, in November 1914.

(272) 10. **Cymothoë staudingeri** Aurivillius

Cymothoë staudingeri Aurivillius, 1898, Rhop. Æthiop., p. 212, Pl. iv, fig. 5, ♂.

Two somewhat defective males which I refer without doubt to this species, in spite of the fact that the light mesial band tends to coalesce with the light sagittate submarginal markings about the middle of the fore wing, the dark lunate lines which define these inwardly in the present specimens being fainter than in the figure given by the author of the species. In all other respects the specimens agree perfectly, both on the upper and lower sides, with the descriptions and figures of Aurivillius. The specimens were taken at Medje, one in July, and the other in September.

(273) 11. **Cymothoë jodutta** (Westwood)

Harma jodutta Westwood, 1850, Gen. Diurn. Lep., p. 289.
Harma cyriades Ward, 1871, Ent. Mo. Mag., VIII, p. 120.
Cymothoë aralus Mabille, 1890, Ann. Soc. Ent. France, (6) X, p. 22, Pl. ii, fig. 8.
Cymothoë jodutta Aurivillius, 1912, Seitz, Gross-Schmett., XIII, p. 152, Pl. xxxvc, ♂.

Four males and one female taken at Medje in August and September, and one female caught at Niangara in November.

(274) 12. **Cymothoë ehmckei** Dewitz

Cymothoë ehmckei Dewitz, 1886, Berl. Ent. Zeit., XXX, p. 302, Pl. vii, figs. 3, 4.
Aurivillius, 1912, Seitz, Gross-Schmett., XIII, p. 152, Pl. xxxv*d*, ♂, ♀.

Of this form, which is no doubt merely a local race of *C. jodutta*, there are twenty-two males and six females. All were captured at Medje from May to September, except one male which was taken at Niangara in November.

(275) 13. **Cymothoë capellides,** new species

Plate VIII: Figure 6, *C. capella* Ward, ♂; Figure 5, *C. capellides* Holland, ♂

Allied to *C. capella* Ward, but smaller in size, and easily discriminated from the latter species by the paler gray of the basal areas of both wings on the upper side and the outward extension of this darker area on both wings as well as by the presence of the characteristic dark markings of the genus in the cell and beyond it on the upper side of the fore wings, these dark markings being suppressed in *C. capella*, the end of the cell and the apical third of the fore wing in Ward's species being immaculate, except for the marginal series of spots. Expanse, ♂, 50–55 mm.

There are four males in the collection, all taken at Medje, one in May, the others in August. They show no variation among themselves. The type is in The American Museum of Natural History. Paratypes are in the Holland Collection in the Carnegie Museum.

To make the distinction between the two species plain to the student I give a figure of a typical male specimen of *C. capella* Ward and of the type of the new species.

(276) 14. **Cymothoë cœnis** (Drury)

Plate IX: Figure 3, *C. conformis* Aurivillius, ♀; Figure 7, *C. rubida* Holland, ♀
Papilio cœnis Drury, 1773, Ill. Exot. Ent., II, p. 33, Pl. xix, figs. 1, 2.
Cymothoë cœnis Aurivillius, 1912, Seitz, Gross-Schmett., XIII, p. 151, Pl. xxxvc, ♂, ♀.

There are fifty-six males and three females in the collection. Two of the females belong to the form named *conformis* by Aurivillius and one to the reddish form which I described many years ago in Psyche, VI, p. 215, without giving it a name. *C. cœnis* was bred for me in large numbers at Kangwé in the valley of the Ogové River and later at

Efulen in Cameroon by Dr. A. C. Good. The female is polymorphic, and at least four well-defined varieties in this sex are known. The commonest is that named *althea* by Cramer. The prevalent color of this variety is black, with the wings crossed by a white mesial band. Closely allied to it is the form called *euthalioides* by Kirby, in which the white mesial band is broader and more irregular than in *althea*. Our plate gives accurate representations of the other two varieties to which reference has been made and a verbal description is not called for. I take pleasure in designating the single specimen obtained by the American Museum Congo Expedition at Medje as the type of *C. cœnis* form **rubida**, new form, ♀, but have selected a more perfect specimen from my own collection taken at Kangvé for representation on the plate. I have many *ex larva*.

The specimens of *C. cœnis* brought back by the Expedition were almost all taken at Medje from June to September 1910, but there are a couple ticketted as taken at Gamangui in June, one is labelled as from Munie Katoto, September 1909, a few from Avakubi caught in October of that same year, and several from Niangara captured in November 1910.

(277) 15. **Cymothoë adelina** (Hewitson)

Plate VIII: Figure 9, ♂; Figure 10, ♀

Harma adelina Hewitson, 1869, Exot. Butt., IV, *Harma*, Pl. iii, figs. 9, 11, ♀.
(*Non Cymothoë adelina*, ♂) Aurivillius, 1912, Seitz, Gross-Schmett., XIII, p. 152, Pl. xxxv*d*.

Aurivillius in his 'Lepidoptera Æthiopica,' p. 215, makes *C.* (*Harma*) *altisidora* (Hewitson) a synonym of *C. adelina*, regarding the former as being the male of the latter, which has priority. In Seitz, Gross-Schmetterlinge, XIII, Pl. xxxv*d*, he depicts a male of the following species as that sex of *adelina*, and also gives a figure of a female which certainly does not conform to Hewitson's type of *C. adelina*. However, this species is wonderfully variable in the female sex, as I have pointed out. I am convinced that Dr. Aurivillius is in error. I give on Plate VIII, fig. 9, a representation of the true male of *C. adelina* (Hewitson). It is an insect closely allied to *C. cœnis*, from which it consistently differs in always having the ground-color of the wings on the upper side deep Naples yellow and not white or creamy white, as is the case with *C. cœnis*. With some hundreds of *C. cœnis* before me as I write, and a good series of *C. adelina* both males and females, the difference is plainly visible and strikingly constant. The females of *C. adelina* are exceedingly variable in the ground-color or tint of the wings, although the black spots and bands are quite uniform in all specimens I have seen, and I have examined many scores of this sex. I do not possess a female as light in color as the one figured by Aurivillius, but some which come very near to it. Most specimens are some shade of orange-red, from that passing into dark sienna and even deep umber. Two bred specimens received some years ago from Dr. A. C. Good are almost black, the maculation being almost lost on the darkly colored ground of the wings. With these dark female specimens there emerged some females which are much lighter.

The specimens belonging to the collection upon which I am reporting were taken at Medje from June to September, except one pair, which was taken at Niangara in November.

(278) 16. **Cymothoë angulifascia** Aurivillius

Plate X, Figure 9, ♂

Cymothoë angulifascia Aurivillius, 1897, Öfvers. Sv. Vet.-Akad. Förh., LIV, 5, p. 285, fig. 3, ♀; 1912, Seitz, Gross-Schmett., XIII, p. 153, Pl. xxxvi*b*, ♀.

This species, of which hitherto only the female has been recognized, is represented in the collection before me by eight males and two females. I also have a fine pair collected for me more than twenty years ago by Dr. A. C. Good at Kangvé on the Ogové River. The females agree perfectly with the description and figures given by Dr. Aurivillius. The males, by the markings on the under side of the wings, disclose their specific identity with the females. Aurivillius has provisionally placed *C. angulifascia* in the same group with *C. sangaris* (Godart) and its allies. Now that we know the male sex of the species, it seems to me better to put it into what Aurivillius terms the "*Cœnis* Group."

I do not think it necessary to give a detailed verbal description of the male, as the excellent figure on the plate will enable any one to recognize the insect. It is, in fact, so far as the wings show, almost exactly like the male *C. adelina* in Seitz, XIII, Pl. xxxv*d*, but the markings on the under side agree with those of *C. angulifascia* Aurivillius and are reddish throughout.

The specimens were all captured at Medje, three of the males in April, the rest from July to September. One of the females was caught in August, the other in September.

(279) 17. **Cymothoë sangaris** (Godart)

Nymphalis sangaris Godart, 1823, Enc. Méth., IX, p. 384, ♂.
Harma uselda Hewitson, 1869, Exot. Butt., IV, *Harma*, Pl. iii, figs. 13, 14, ♀.

Two male specimens, one taken at Munie Katoto, September 10, 1909, the other at Medje, June 10, 1910.

(280) 18. **Cymothoë aramis** (Hewitson)

Plate X: Figure 1, ♂; Figure 2, ♀

Euryphene aramis HEWITSON, 1865, Exot. Butt., III, *Euryphene*, Pl. IV, figs. 16, 17, ♀.
Adolias fulvomacula CAPRONNIER, 1889, Ann. Soc. Ent. Belgique, XXXIII, Bull., p. cxliv, ♀.
Cymothoë aramis AURIVILLIUS, 1912, Seitz, Gross-Schmett., XIII, p. 153, Pl. XXXVIc, ♀.

This species has hitherto only been known by the female sex, except by myself. For many years a series of males has been standing in my cabinets awaiting the coming of a favorable opportunity to describe them, which now fortunately arrives. Instead, however, of giving a long verbal description, I shall rely more upon the figure on the plate to aid the student in the identification of the species. The male is in outline and in the shape and location of the markings very much like *C. anatorgis* (Hewitson) (see Plate X, fig. 7, ♂; fig. 8, ♀; specimens in Holland Coll.) but may be discriminated from that species at a glance by the quite different color of the upper side of the wings. In *C. anatorgis* the ground-color of the wings is deep blood-red, as in *C. sangaris;* in *aramis* the ground-color is dark ochraceous, the tint being very much the same as the ground-color of the wings in *C. lurida* or *C. cyclades.*

The American Museum Congo Expedition brought back two males, which were taken at Medje, September 27, 1910. I have a series of males and females taken at Kangvé on the Ogové River more than twenty years ago.

(281) 19. **Cymothoë coccinata** (Hewitson)

Harma coccinata HEWITSON, 1874, Exot. Butt., V, *Harma*, Pl. VI, figs. 24–26, ♂.
Cymothoë coccinata AURIVILLIUS, 1912, Seitz, Gross-Schmett., XIII, Pl. XXXVIc, ♂; XXXVId, ♀.

Of this species the Expedition returned seventy-four males, all captured at Medje, except two which are labelled as taken at Gamangui in June. A few were taken in April, the remainder were caught from June to September.

(282) 20. **Cymothoë Reginæ-Elizabethæ,** new species

Plate X: Figure 5, ♂, type; Figure 6, ♀, allotype

♂. The males are without the light spot about the middle of the costa of the secondaries on the upper side, which is a marked feature in *C. aramis, anatorgis*, and *coccinata*. The edge of the costa towards the base is simply narrowly laved with pale yellowish, which cannot be seen except by parting the fore and hind wings. The prevalent color of the upper side of the wings is warm vermilion, somewhat paler than in the case of *C. coccinata*, and much lighter in tone than in *C. sangaris* and *C. ogova*.

The wings are crenulate, slightly concave about the middle of the margin of the primaries and truncated at their lower angle thus resembling in outline the wings of *C. sangaris*, which is a much larger species. The hind wings are somewhat produced at the anal angle, but not more so than is the case in *C. aramis* and *C. anatorgis*. Both wings are defined outwardly by very fine black lines, except on their inner margins; both have a submarginal series of quite small black dots on the interspaces, those of the fore wing tending in a number of specimens before me to become obsolete, those on the hind wings, which are larger and more conspicuous than those of the fore wings, in some specimens tending to become arcuate or sagittate toward the anal angle.

♀. The female in general appearance is not unlike the female of *C. ogova* (Plœtz), but the white transverse band on the upper side of the secondaries lies much nearer the base than in that species, and the dark basal area, which succeeds it inwardly is correspondingly reduced in extent. The differences between the two sexes as shown by the upper side of the wings is clearly revealed in the figures given upon Plate X.

Expanse, ♂, 52 mm.; ♀, 65 mm.

There are thirteen males and two females of this beautiful species in the collection. They were all taken at Medje (type locality) in July and August, except one male which is labelled as caught at Niangara in November.

On the occasion of the visit to the Carnegie Institute by their Majesties, the King and the Queen of the Belgians, and of His Royal Highness, the Crown Prince Leopold, Duke of Brabant, on October 23, 1919, I had the honor of showing to Her Majesty, the Queen, a proof of Plate X of this paper, which was lying upon my desk. I requested Her Majesty to accord to me the privilege of naming this lovely butterfly in her honor, and she most graciously acceded to my request, expressing pleasure at the thought. It therefore bears the name of the Queen of the Belgians.

The types are in The American Museum of Natural History; paratypes in the Holland Collection.

(283) 21. **Cymothoë ogova** (Plœtz)

Plate X: Figure 3, ♂; Figure 4, ♀

Harma ogova Plœtz, 1880, Stett. Ent. Zeit., XLI, p. 193, ♀.

Cymothoë ogova Aurivillius, 1912, Seitz, Gross-Schmett., XIII, p. 154, Pl. xxxvi*b*, ♀.

The male of this species has never hitherto been described or figured. I possess a series of eighteen males and twenty-two females bred for me more than twenty years ago by Dr. A. C. Good at Kangvé on the Ogové River. On Plate X, Fig. 3, I give a figure of the upper side of the wings of the male and in Fig. 4 a representation of the wings of the female. The male has a small shining white spot, girdled with black, at the very base of the hind wing, where it joins the body. In the general color of the wings it closely approaches *C. sangaris*, from which, however, it may at once be discriminated by the different form of the outline of the primaries, which are not as much excavated on the margin and truncated at the lower angle as is the case in *C. sangaris*. In the fine suite of females in my possession I detect some variation, and one female has the apical third of the wing not white, but reddish. For this slight variety the name **rubescens** may be proposed, if such things deserve to be discriminated nomenclatorially. Expanse, ♂, 52–60 mm.; ♀, 60–75 mm.

Messrs. Lang and Chapin did not take any specimens of this species, but I atone for the lack by donating to The American Museum of Natural History a pair taken from my cabinet. I have no doubt that it occurs on the Upper Congo, as well as in the valley of the Ogové.

EUPTERA Staudinger

(284) 1. **Euptera pluto** (Ward)

Euryphene pluto WARD, 1873, Ent. Mo. Mag., X, p. 59.

One male taken at Medje the first week in August.

PSEUDATHYMA Staudinger

(285) 1. **Pseudathyma sibyllina** (Staudinger)

Pseudacræa sibyllina STAUDINGER, 1890, Iris, III, p. 338, Pl. III, fig. 8.

Pseudathyma sibyllina STAUDINGER, 1891, Iris, IV, p. 90. Aurivillius, 1912, Seitz, Gross-Schmett., XIII, p. 156, Pl. XLIX*e*.

One male taken at Medje the first week in August 1910.

The specimen differs slightly from the descriptions and figures of this species which have been given by both Staudinger and Aurivillius. It would, however, be a mistake to attempt to describe it as a different species without more material at hand. There is before me a good specimen of *Pseudathyma neptidina* from the Ogové Valley, which the specimen somewhat closely resembles on the under side, but the absence on both sides of the long white bar in the cell of the fore wing, which is one of the diacritical marks of *P. neptidina*, forces me to assign it to *P. sibyllina*, with which it agrees better than with any other species which has been described. The specimens representing this genus in the collections of the world are thus far very few, and, beside the individual I am reporting upon and a few in my own collection, there are no others in America, and only half a dozen in the museums of Europe. No doubt the insect is common enough, but its mimetic resemblance to other forms which are so common as to make them almost unworthy of notice by collectors, has led to its having been overlooked.

EUXANTHE Hübner

(286) 1. **Euxanthe trajanus** (Ward)

Godartia trajanus WARD, 1871, Ent. Mo. Mag., VIII, p. 36.
Euxanthe trajanus AURIVILLIUS, 1911, Seitz, Gross-Schmett., XIII, p. 123, Pl. XXIX*f*.

One male, Medje, September 1910.

(287) 2. **Euxanthe ansellica** (Butler)

Godartia ansellica BUTLER, 1870, Trans. Ent. Soc. London, p. 525.
Euxanthe ansellica AURIVILLUS, 1911, Seitz, Gross-Schmett., XIII, p. 124, Pl. XXIX*f*, by error on plate there given as *eurinome*.

Four males, one taken at Bafwabaka, December 3; the others captured at Medje, one in each of the months, May, August, and September.

(288) 3. **Euxanthe crossleyi** (Ward)

Godartia crossleyi WARD, 1871, Ent. Mo. Mag., VIII, p. 36.
Euxanthe crossleyi AURIVILLIUS, 1911, Seitz, Gross-Schmett., XIII, p. 124.

Three males caught at Medje, July 1910.

CHARAXES Ochsenheimer

(289) 1. **Charaxes epijasius** Reiche

Charaxes epijasius REICHE, 1849, in Ferret and Galinier, Voyage en Abyssinie, Entomologie, p. 469, Pl. XXXII, figs. 1, 2. AURIVILLIUS, 1911, Seitz, Gross-Schmett., XIII, p. 126, Pl. XXX*a*.

The species is represented by two males, one taken at Faradje, and simply ticketted "1911–1912," the other labelled "Niangara, November 20–25, 1910." The latter is the more perfect specimen.

This is the first record of this species from the Belgian Congo and extends the known range. It has been recorded from Senegal, Nigeria, and the Togo country and eastward to Abyssinia and Unyoro.

(290) 2. **Charaxes brutus angustus** Rothschild and Jordan

Papilio brutus CRAMER, 1779, Pap. Exot., III, p. 82, Pl. CCXLI, figs. *E*, *F*.
Charaxes brutus angustus ROTHSCHILD AND JORDAN, 1900, Nov. Zool., VII, p. 432.
Charaxes angustus AURIVILLIUS, 1911, Seitz, Gross-Schmett., XIII, p. 126, Pl. XXX*a*.

Without exception the specimens before me belong to the form to which Rothschild and Jordan have given the above name. This is also true of all the specimens which I have received from Cameroon and the valley of the Ogové River. It is the prevailing form in the hot, wooded lands of the central Ethiopian region, and is easily distinguished from typical *C. brutus* from Sierra Leone and adjacent parts.

The collection contains ninety-six males, of which twenty-one are not as yet expanded. With the exception of one example taken at Bafwaboli, September 11, and another taken at Bafwasende, September 27, 1909, all of the specimens were captured at Medje, a few in the first week in April, the rest from early in July to about the middle of September.

(291) 3. **Charaxes castor** (Cramer)

Papilio castor Cramer, 1775, Pap. Exot., I, p. 61, Pl. xxxvii, figs. *C*, *D*.
Charaxes castor Aurivillius, 1911, Seitz, Gross-Schmett., XIII, p. 127, Pl. xxx*a*.

There are ten males of this well-known insect belonging to the characteristic West African form, which has the basal spots of the under side black instead of chestnut. Professor Aurivillius has proposed the subspecific name *C. godarti* for this form. One specimen was captured at Niangara on November 8, 1910. The other examples were all taken at Medje, two in the month of May, the rest in July and August.

(292) 4. **Charaxes pollux** (Cramer)

Papilio pollux Cramer, 1775, Pap. Exot., I, p. 61, Pl. xxxvii, figs. *E*, *F*.
Charaxes pollux Aurivillius, 1911, Seitz, Gross-Schmett., XIII, p. 127, Pl. xxx*b*.

One male taken at Bafwasende, October 23, 1909.

(293) 5. **Charaxes eudoxus** (Drury)

Papilio eudoxus Drury, 1782, Ill. Exot. Ent., III, p. 44, Pl. xxxiii, figs. 1, 4.
Charaxes eudoxus Aurivillius, 1911, Seitz, Gross-Schmett., XIII, p. 128.

There are three males which I refer to this species. They were taken at Medje, one in May, one in July, and another in August. They are absolutely alike and may be distinguished at once from the following species by the great reduction in width of the silvery bands on the lower side of the hind wings, as well as by the prolongation costad of the median fulvous band of the fore wings on the upper side.

The species is rare in collections.

(294) 6. **Charaxes mechowi** Rothschild and Jordan

Charaxes eudoxus mechowi Rothschild and Jordan, 1900, Nov. Zool., VII, p. 419; 1899, *loc. cit.*, VI, Pl. viii, fig. 3.
Charaxes mechowi Aurivillius, 1911, Seitz, Gross-Schmett., XIII, p. 128, Pl. xxx*c*, name *eudoxus* on plate an error.

There are seven males of this species, agreeing throughout with others which we have from Cameroon. The figure given by Aurivillius (cf. Seitz, 'Die Gross-Schmetterlinge des Afrikanischen Faunengebietes,' Pl. xxx) does not agree with the specimens before me in not having the dark markings of the outer angle of the fore wings accentuated, as they are in these specimens, by a short dark submarginal bar extending from vein 1 and vein 3, and defining the median band outwardly.

Like the preceding form this is a rare species, the female of which has never, I believe, been found or described.

(295) 7. **Charaxes etesipe** (Godart)

Nymphalis etesipe Godart, 1823, Enc. Méth., IX, p. 355.
Charaxes etesipe Aurivillius, 1911, Seitz, Gross-Schmett., XIII, p. 128, Pl. xxxc.

This seems to be a very common species, judging from the number of specimens taken. Curiously, all of them are males. There are one hundred and thirty-three examples, all taken at Medje, a number in the early part of April, the rest from the beginning of July to the early part of September.

(296) 8. **Charaxes protoclea** Feisthamel

Charaxes protoclea Feisthamel, 1850, Ann. Soc. Ent. France, (2) VIII, p. 260.
Charaxes æson Herrich-Schæffer, 1850, Aussereur. Schmett., figs. 9, 10, ♀.
Charaxes protoclea Aurivillius, 1911, Seitz, Gross-Schmett., XIII, p. 129, Pl. xxxiii*a*.

The collection includes one hundred and twelve males and four females. One male is labelled "Niangara, November 8–9, 1910," another is from Faradje, captured in 1911. All the rest were taken at Medje, a number early in April, the remainder from the beginning of July to the middle of September.

(297) 8*a*. **Charaxes protoclea marginepunctata,** new variety

A number of specimens of this species have a well-developed series of submarginal black spots located on the cadmium-orange border of the hind wings. The vast majority of specimens of *C. protoclea* have only one such spot on the interspace between veins 7 and 8. For this form with the submarginal spots I propose the above varietal name. The type is in the Holland Collection from Gaboon, paratypes are in the present collection, belonging to The American Museum of Natural History, and in the Holland Collection from various localities in tropical Africa.

(298) 9. **Charaxes cynthia** Butler

Charaxes cynthia Butler, 1865, Proc. Zool. Soc. London, p. 626, Pl. xxxvii, fig. 3.
Aurivillius, 1911, Seitz, Gross-Schmett., XIII, p. 130, Pl. xxxi*a*.

Of this species there are in the collection seven unexpanded and thirty-four expanded males. They were collected at Medje, a few in April, the rest from the end of June to the beginning of September.

(299) 10. **Charaxes lucretius** (Cramer)

Papilio lucretius Cramer, 1777, Pap. Exot., I, p. 129, Pl. lxxxii, figs. *E*, *F*.
Charaxes lucretius Aurivillius, 1911, Seitz, Gross-Schmett., XIII, p. 130, Pl. xxx*d*.

Of this well-known and common species there are before me in the collection forty-two males. One is labelled "Ngayu, December 14, 1909," another "Niangara, November 20–25, 1910," and a third "Bafwasende, September 23, 1909." All the others were taken at Medje, a couple in April, the rest from early in June to the middle of September.

(300) 11. **Charaxes smaragdalis** Butler

Charaxes smaragdalis Butler, 1865, Proc. Zool. Soc. London, p. 630, Pl. xxxvi, fig. 5. Aurivillius, 1911, Seitz, Gross-Schmett., XIII, p. 131.

There are twenty-two males in the collection, one labelled "Munie Katoto, September 10, 1909," another "Niangara, November 20–25, 1910." The rest were taken at Medje, two in April, the remainder from July to the middle of September, most of them, however, in August.

(301) 12. **Charaxes numenes** (Hewitson)

Nymphalis numenes Hewitson, 1859, Exot. Butt., II, *Nymphalis*, Pl. ii, figs. 9, 10, 11.
Charaxes numenes Aurivillius, 1911, Seitz, Gross-Schmett., XIII, p. 132, Pl. xxxi*c*.

The collection includes ninety-eight males and one female, all of which were taken at Medje, a few in April, the rest from July to September 1910.

(302) 13. **Charaxes tiridates** (Cramer)

Papilio tiridates Cramer, 1777, Pap. Exot., II, p. 100, Pl. clxi, figs. *A*, *B*.
Charaxes tiridates Aurivillius, 1911, Seitz, Gross-Schmett., XIII, p. 132, Pl. xxxi*b*.

There are one hundred and seventy-six males and one female of this species in the collection. They were all taken at Medje, quite a large number in April, the rest in July and August, except a few captured in the early part of September.

(303) 14. **Charaxes bipunctatus** Rothschild

Charaxes bipunctatus Rothschild, 1894, Nov. Zool., I, p. 536. Aurivillius, 1911, Seitz, Gross-Schmett., XIII, p. 132.

Seven males, one not expanded. All were taken at Medje, six in August, and one in September.

(304) 15. **Charaxes imperialis** Butler

Charaxes imperialis Butler, 1874, Trans. Ent. Soc. London, p. 531, Pl. xi, fig. 3. Aurivillius, 1911, Seitz, Gross-Schmett., XIII, p. 132.

Ten males, all taken at Medje, one in April, one in July, and four in each of the months of August and September.

(305) 16. **Charaxes ameliæ** Doumet

Charaxes ameliæ DOUMET, 1861, Rev. Zool., (2) XIII, p. 171, Pl. v, fig. 1. AURIVILLIUS, 1911, Seitz, Gross-Schmett., XIII, p. 133, Pl. xxxi*b*.

There are one hundred and ninety-two specimens of this species in the collection, forty-one of which have not been expanded. They are all males. They were taken at Medje, a number early in April, the rest from July to the middle of September.

(306) 17. **Charaxes hadrianus** Ward

Charaxes hadrianus WARD, 1870, Ent. Mo.Mag., VIII, p. 120. AURIVILLIUS, 1911. Seitz, Gross-Schmett., XIII, p. 133, Pl. xxxi*d*.

Represented by twenty-seven males, six not expanded, all taken at Medje. One was caught in April, the rest from July to September, but the greater number were taken in August.

(307) 18. **Charaxes nobilis** Druce

Charaxes nobilis DRUCE, 1873, Ent. Mo. Mag., X, p. 13. AURIVILLIUS, 1911, Seitz, Gross-Schmett., XIII, p. 133, Pl. xxxiic.

A single male specimen of this rare species was taken at Medje on May 29, 1910. It lacks one antenna and is slightly rubbed.

(308) 19. **Charaxes anticlea** (Drury)

Papilio anticlea DRURY, 1782, Ill. Exot. Ent., III, p. 36, Pl. xxvii, figs. 5, 6.
Charaxes anticlea AURIVILLIUS, 1911, Seitz, Gross-Schmett., XIII, p. 134, Pl. xxxiii*d*.

Six males captured at Medje, the dates varying from July to September.

(309) 20. **Charaxes hildebrandti** (Dewitz)

Nymphalis hildebrandti DEWITZ, 1879, Nov. Act. Acad. Nat Cur., XLI, p. 28, Pl. ii, fig. 16.
Charaxes hildebrandti AURIVILLIUS, 1911, Seitz, Gross-Schmett.., XIII p. 134, Pl. xxxiiic.

Nine males taken at Medje from July to September.

(310) 21. **Charaxes etheocles** (Cramer)

Papilio etheocles CRAMER, 1777, Pap. Exot., II, p. 34, Pl. cxix, figs. *D*, *E*.
Charaxes etheocles AURIVILLIUS, 1911, Seitz, Gross-Schmett., XIII, p. 135, Pl. xxxiii*b*.

Of this polymorphic and decidedly puzzling species there is a large series of males and a solitary female. The female, which was taken at Medje, June 28, 1910, does not agree absolutely with any form of the female figured by authors, but comes nearest to that given by Staudinger (Iris, 1896, IX, Pl. III, fig. 4), which Rothschild and Jordan in their revision of the genus accept as the typical female of *C. etheocles* (cf. Nov. Zool., 1900, VII, p. 486).

The males, of which there are one hundred and twenty-one specimens, belong principally to the form described by Butler as *Charaxes hollandi* (cf. Ann. Mag. Nat. Hist., 1893, (6) XII, p. 266), and the form described by Staudinger under the name *Charaxes catochrous* (cf. Iris, IX, 1896, p. 216), in which the basal two-thirds of the wings are whitish on the under side. There is one male taken at Niangara in September which fits the description given by Rothschild and Jordan of the form to which they have applied the name *picta*. There are some intergrading forms which are not exactly referable to any of those just mentioned. As is well known to students, the species with which we are dealing is excessively variable and it is not wise to attempt without the test of breeding to decide what are the exact relationships of the variant forms which every new collection from Africa reveals.

The specimens, with the exception of the example of *C. etheocles picta* taken at Niangara, as mentioned above, and a male of *C. etheocles hollandi* taken at Faradje, were all collected at Medje or near by. The dates of capture are early in April in the case of a few specimens, but the majority are labelled as having been taken from July to September. but principally in August.

(311) 22. **Charaxes candiope** (Godart)

Nymphalis candiope GODART, 1813, Enc. Méth., IX, p. 353.
Charaxes candiope AURIVILLIUS, 1912, Seitz, Gross-Schmett., XIII, p. 138, Pl XXXIIa.

Of this species there are in the collection ninety-two males. With the exception of two taken at Niangara in November and one captured at Gamangui in June, they were all collected at Medje, a few early in April, the rest from July to September, principally from the middle of July to the end of August.

(312) 23. **Charaxes kahldeni** Homeyer and Dewitz

Charaxes kahldeni HOMEYER AND DEWITZ, 1882, Berl. Ent. Zeit., XXVI, p. 381, Pl. VII, figs. 1, 2. AURIVILLIUS, 1912, Seitz, Gross-Schmett., XIII, p. 139.

Of this pretty little species there are thirty-eight males, all taken at Medje from June to early September 1910.

(313) 24. **Charaxes eupale** (Drury)

Papilio eupale DRURY, 1782, Ill. Exot. Ent., III, p. 7, Pl. VI, fig. 3.
Charaxes eupale AURIVILLIUS, 1912, Seitz, Gross-Schmett., XIII, p. 140, Pl. XXXIIc

One hundred and sixteen males, two taken at Niangara in November, one at Gamangui in June, and the rest at Medje, a few early in April, the rest from June to September, but principally in July and August. Of the "washed out" form named *C. dilutus* by Rothschild and Jordan there are several examples. It is hardly worthy of a subspecific name, being connected with the more strongly marked form by intergrades.

(314) 25. **Charaxes nichetes** Grose-Smith

Charaxes nichetes Grose-Smith, 1883, Ent. Mo. Mag., XX, p. 58.
Charaxes ogovensis Holland, 1886, Trans. Amer. Ent. Soc., XIII, p. 330, Pl. viii, fig. 2.
Charaxes nichetes Aurivillius, 1912, Seitz, Gross-Schmett., XIII, p. 140, Pl. xxxii*b*.

One male taken at Medje in September 1910.

(315) 26. **Charaxes porthos** Grose-Smith

Charaxes porthos Grose-Smith, 1883, Ent. Mo. Mag., XX, p. 57. Smith and Kirby, 1887, Rhop. Exot., I, *Charaxes*, p. 2, Pl. i, figs. 4, 5.

One male taken at Medje in the beginning of August.

(316) 27. **Charaxes zelica** Butler

Charaxes zelica Butler, 1869, Ent. Mo. Mag., VI, p. 28. Aurivillius, 1912, Seitz, Gross-Schmett., XIII, p. 141, Pl. xxxii*b*.

One male captured at Medje early in August.

(317) 28. **Charaxes laodice** (Drury)

Papilio laodice Drury, 1782, Ill. Exot. Ent., III, p. 34, Pl. xxvi, figs. 1, 2.
Charaxes laodice Aurivillius, 1912, Seitz, Gross-Schmett., XIII, p. 141, Pl. xxxiic.

An expanded male taken at Medje, April 6, 1910, and another not expanded.

(318) 29. **Charaxes doubledayi** Aurivillius

Charaxes doubledayi Aurivillius, 1899, Kongl. Sv. Vet.-Akad. Handl., XXXI, p. 244; Seitz, Gross-Schmett., XIII, p. 141, Pl. xxxiic.

A series of twenty-one males taken at Medje, a few in April, the rest from July to September.

(319) 30. **Charaxes mycerina** (Godart)

Nymphalis mycerina Godart, 1835, Enc. Méth., IX, p. 369.
Charaxes mycerina Aurivillius, 1912, Seitz, Gross-Schmett., XIII, p. 141.

One male taken at Medje in the first week of September 1910.

The separation of the form *C. doubledayi* Aurivillius from *C. mycerina* (Godart) made by Prof. Aurivillius on the basis of the absence of the marginal blue spots on the fore wing of the latter form appears to the writer justifiable, but with long series of specimens before him from all parts of tropical west and central Africa, he finds that a regular intergradation in this character occurs, and a regular series running from spotless *C. mycerina* to much-spotted *C. doubledayi* can be arranged.

PALLA Hübner

(320) 1. **Palla vologeses** Mabille

Palla vologeses MABILLE, 1876, Bull. Soc. Zool. France, I, p. 280.
Charaxes vologeses AURIVILLIUS, 1912, Seitz, Gross-Schmett., XIII, p. 139, Pl. XXXII*d*.

A solitary male specimen taken at Niangara about the middle of November.

(321) 2. **Palla fulvescens** Aurivillius

Palla fulvescens AURIVILLIUS, 1891, Ent. Tidskr., XII, p. 216.
Charaxes fulvescens AURIVILLIUS, 1912, Seitz, Gross-Schmett., XIII, p. 139, Pl. XXXII*d*.

There are seventy-four specimens of this species before me, all of them being males. With the exception of one specimen which is ticketed "Niangara, XI, 20–23, 1910," all were taken at Medje. A few were captured in the month of April, and bear no later date than the 6th of that month. One is stated to have been taken on June 11. All the rest were taken at dates ranging from July 3 to September 6, 1910.

From the evidence of the labels it would appear that the species is at least double-brooded, and there may be three broods during the year.

(322) 3. **Palla decius** (Cramer)

Papilio decius CRAMER, 1777, Pap. Exot., II, p. 26, Pl. CXIV, figs. *A*, *B*.
Palla decius AURIVILLIUS, 1912, Seitz, Gross-Schmett., XIII, p. 141, Pl. XXXII*d*.

There are three males before me, two of which were taken at Medje about the middle of July, and one at the same place near the end of August.

(323) 4. **Palla ussheri** Butler

Palla ussheri BUTLER, 1870, Trans. Ent. Soc. London, p. 124; 1871, Lep. Exot., p. 52, Pl. XXI, fig. 3. AURIVILLIUS, 1912, Seitz, Gross-Schmett., XIII, p. 141, Pl. XXXII*d*.

This species seems to be vastly more common at the places where collections were made than the preceding. There are fifty-seven males. With the exception of one specimen, labelled "Risimu, September 8, 1909," all were taken at Medje, a few early in April, the rest from the first week of July to the middle of September.

PHILOGNOMA Westwood

(324) 1. **Philognoma lichas bebra** (Rothschild)

Charaxes lichas bebra Rothschild, 1900, Nov. Zool., VII, p. 507.
Charaxes bebra Aurivillius, 1912, Seitz, Gross-Schmett., XIII, p. 139.

The collection contains thirty-four males and one female referable to this form. The males differ markedly from the typical form which occurs on the Gold Coast, the dark area of the apical portion of the wing being invaded internally by the lighter color of the body of the wing, as pointed out by Rothschild. The female, however, does not differ at all from females of the typical form in the collection of the writer from Sierra Leone and Cameroon.

They were all collected at Medje, except one labelled as taken at Gamangui on February 6, 1910. The dates of capture run through the months of July and August, with the foregoing exception.

(325) 2. **Pbilognoma paphianus** (Ward)

Charaxes paphianus Ward, 1871, Ent. Mo. Mag., VIII, p. 120.
Philognoma falcata Butler, 1872, Lep. Exot., p. 101, Pl. xxxviii, fig. 1.
Charaxes paphianus Aurivillius, 1912, Seitz, Gross-Schmett., XIII, p. 139, Pl. xxxii*a*.

There are in the collection sixty-five males, of which nine are not expanded. With the exception of a single specimen labelled as taken at Gamangui, June 6, 1907, all were captured at Medje, the dates ranging from early in June to about the middle of September. The specimens show very little variation.

MONURA Mabille

(326) 1. **Monura zingha** (Cramer)

Papilio zingha Cramer, 1780, Pap. Exot., IV, p. 53, Pl. cccxv, figs. *B*, *C*.
Charaxes zingha Aurivillius, 1911, Seitz, Gross-Schmett., XIII, p. 128, Pl. xxxii*d*.

This species is represented by one hundred and thirty-one males and three females. With the exception of one male which is labelled as having been taken at Niangara on September 26, all of the specimens were captured at Medje. A few were taken in the first week of April. The greater number were captured in July and August, the earliest date being June 30, and the latest September 9, 1910.

Libytheidæ

LIBYTHEA Fabricius

(327) 1. **Libythea labdaca** Westwood

Libythea labdaca Westwood, 1851, Gen. Diurn. Lep., II, p. 413, note, Pl. lxviii, fig. 6.
Dichora labdaca Scudder, cf. *infra*.

Libythea labdaca AURIVILLIUS, 1913, Seitz, Gross-Schmett., XIII, Pl. LXI*a*.

Of this interesting insect, for which the late Dr. S. H. Scudder proposed the generic name *Dichora* (cf. Report U. S. Geol. Survey, VIII, part 1, p. 470) there are nineteen specimens: six taken at Medje, four in June, one in August, and one in September 1910; three collected at Basoko in July, 1909; three taken at Isangi and one at Stanleyville in August 1909; four collected at Avakubi in September 1909; and two badly worn examples taken at Lubila in the same month and year.

This butterfly in some years is quite scarce and only occasional examples are taken; and again it appears in enormous numbers, fairly swarming, as I have been informed by collectors resident in Cameroon and on the Gold Coast.

Lemoniidæ

ABISARA Felder

(328) 1. **Abisara rogersi** Druce

Abisara rogersi DRUCE, 1878, Ent. Mo. Mag., XV, p. 101.
Abisara geryon DEWITZ, 1889, Ent. Nachr., XV, p. 105, Pl. I, figs. 3, 4.

A solitary male, captured at Niangara in November 1910.

(329) 2. **Abisara intermedia** Aurivillius

Abisara intermedia AURIVILLIUS, 1895, Ent. Nachr., XXI, p. 381.

There are two males of this form, both taken at Medje, one in April, the other in September. With these I associate three females, one taken in each of the months April, July, and September at the same place. They agree with the males on the under side of the wings.

(330) 3. **Abisara rutherfordi** Hewitson

Abisara rutherfordii HEWITSON, 1874, Ent. Mo. Mag., XI, p. 56.
Abisara rutherfordi AURIVILLIUS, 1913, Seitz, Gross-Schmett., XIII, Pl. LXI*b*.

There are three males and two females of this species captured at Medje, one female in June, all the others in August.

Lycænidæ

The genera and species of this family known to occur in the region of the Congo are not only very numerous, but of the highest interest. The Ethiopian Subregion is the metropolis of some of the most aberrant forms of this great family, which display to a wonderful degree the phenomena of "mimicry." Many species are gorgeously beautiful and bizarre in their coloring, and in their habits are no less wonderful, quite a large number of them being in their larval state carnivorous, or entomophagous, and many being myrmecophilous.

The collection assembled by the American Museum Congo Expedition is very limited both in the number of specimens and species, and is by no means representative of this portion of the fauna. Nevertheless, it possesses the highest interest, and it is to be regretted that the gentlemen in charge had not the opportunity to devote more time to careful collecting in the parts which they visited. Small as is the collection, it contains a number of novelties, thus showing how much might have been ascertained had the native collectors been induced to turn their attention to this particular group. In proportion to the number of specimens brought back, the number of species new to science is considerable. There are also some species which, until the present time, have been very inadequately represented in the collections of the world and which it has been a pleasure to the writer to study and examine.

Lipteninæ

TELIPNA Aurivillius

(331) 1. **Telipna rothioides,** new species

Plate XII, Figure 7, ♀

♀. Near *T. rothi* Grose-Smith, but may be distinguished from that species by the facts that on the upper side of the primaries the transverse reddish yellow band does not reach the costa, as it does in *T. rothi*, that the black marginal border on the upper side of the secondaries is broader than in *T. rothi*, and by the further fact that on the under side of the secondaries the marginal row of white spots surrounded by black terminates abruptly at vein 5, and does not completely encircle the wing as is the case in *T. rothi*. There are other minor differences, but those stated will enable the student to discriminate this form from *T. rothi*, to which, until I had made a critical examination, I was inclined to refer it, and which it otherwise superficially resembles.

The collection contains two females, both captured at Medje, one in April, the other in July. The latter is designated as the type and is in The American Museum of Natural History in New York; the former, which is the paratype, is in the Holland Collection in the Carnegie Museum in Pittsburgh.

(332) 2. **Telipna medjensis,** new species

Plate XII, Figure 8, ♀

♀. Near *T. nyanza* Neave (cf. Novitates Zoologicæ, 1904, XI, p. 335, Pl. I, fig. 19). It differs, however, from the species described and figured by Neave in important particulars. The subapical white spot of the primaries is much larger than in *T. nyanza*, extending from vein 4 to vein 8, and reappears conspicuously on the under side of the wing, which is not the case in Neave's species. On the under side this spot is bordered inwardly by a heavy black bar, running from the costa to vein 4, and on the under side this spot is not defined outwardly by dark markings, and the entire apical region beyond it, save immediately on the costa, is immaculate yellowish red, like the ground-color of the rest of the wing. The under side of the secondaries also differs from *T. nyanza* in that there are five, instead of three black bars on the costa, as in the latter species, the third from the base running downward across the end of the cell. There are also two minute black dots, one above the other, in the cell beyond its middle, and in interval 5 there is a conspicuous squarish black spot. Furthermore the black outer border of the secondaries on the lower side terminates abruptly at the extremity of vein 5, as in the preceding species, the pale yellowish red ground-color between veins 5 and 7 extending outwardly quite to the border of the wing, separated from the cilia only by a very narrow black marginal line. The cilia are broadly checkered with white between the extremities of the nervules where they are black. Succeeding the fine black marginal line there is a row of sublunate white spots sharply defined upon the deep black border, extending from the anal angle as far as the interval between veins 3 and 4. At a remove of about two millimeters from this row of spots basad there is another row of similar larger white spots, each spot totally surrounded by the deep black of the border, which terminates inwardly just above them. Expanse, 50 mm.

The type, which is from Medje and is unique, is in the American Museum of Natural History.

(333) 3. **Telipna bimacula** (Plœtz)

Pentila bimacula Plœtz, 1880, Stett. Ent. Zeit., XLI, p. 199.

The species is represented by but one female specimen, which is in The American Museum of Natural History. It was taken at Niangara about the middle of November 1910, and does not differ in the least from long suites of the species which we possess from the valley of the Ogové and from Cameroon.

PENTILA Westwood

(334) 1. **Pentila clarensis** Neave

Plate XII, Figure 11 upper side ♂, from Faradje; Figure 12 upper side ♂, from Basoko

Pentila clarensis Neave, 1903, Ent. Mo. Mag., XXXIX, pp. 136–137.

There are two specimens taken at Faradje, "1911–1912," which agree so closely with the description of this species that I have no doubt that they represent it. There are four other specimens, one taken at Basoko in July 1909, two captured at Gamangui in June, and one taken at Medje in July 1910, which in the main agree with those taken at Faradje and which cannot be separated from them specifically. These four appear to me to be at most representatives of a seasonal or local variety, the only difference being the increased size and therefore more prominent appearance of the spots on the upper and lower sides of the wings. In the specimens from Faradje the discal spots are much reduced in size, and some are almost obsolete, as Neave points out to have been the case with some of the specimens before him when he wrote his description. The specimens from Gamangui, Basoko, and Medje agree very closely with each other in every particular and have a facies which is somewhat different from the specimens taken at Faradje. When an analysis of the facts is made, however, it clearly appears that the only real difference is due to the uniform enlargement of the various spots upon the wings. As Neave points out, this insect is a close mimic of *Pardopsis punctatissima.* This is particularly true of the specimens with the enlarged spots. From *P. pauli* Staudinger the insect may be discriminated by the fact that the elongated marginal spots, one in each interval of the upper and lower wings, do not entirely reach to the margin, as they do in *P. pauli* (cf. Rhop. Æthiopica, p. 261, where Aurivillius has given us a figure of that species), but constitute a distinct and regular submarginal series, separated from the thin marginal line by an appreciable interval. Many of the spots are, as Neave points out, "moniliform,"—I should say having the shape of a dumb-bell, especially in the apical region of the fore wing. The species is in my judgment valid and not to be confounded with *P. pauli,* which in size and general appearance it somewhat resembles. I discover that we have a series of finely preserved specimens of the species from the interior of Cameroon, collected some years ago by Mr. A. I. Good and awaiting a convenient season for its study, which the arrival of the Lang-Chapin material has created.

(335) 2. **Pentila clœtensi** Aurivillius (?)

Plate XII, Figure 9, ♂

Pentila clætensi Aurivillius, 1897, Ent. Tidskr., XVIII, p. 214, fig.

In the markings of the fore wing agreeing entirely with the description and figure of *P. clætensi* given by Aurivillius, but quite different in the form and arrangement of the spots on the outer border of the hind wing. In the specimens before me the marginal row of spots on the secondaries are located at the tips of the veins and are quite large, sagittate, pointing inwardly and running for some distance along the nervules basad, much as in *P. auga* Karsch, or in some heavily marked specimens of *P. abraxas* Doubleday and Hewitson. I refer the specimens provisionally to *P. clætensi* Aurivillius, with which they agree more closely than with any other species, realizing that there is in this genus more or less variability in the number and size of some of the markings, as is shown by long suites of many of the species in my possession. It is a doubtful procedure to erect species in the genus *Pentila,* basing them upon the presence or absence of some of the spots, or their size.

The collection contains two males taken at Medje, one in August, the other in September.

Pseuderesia Butler

(336) 1. **Pseuderesia libentina** (Hewitson)

Liptena libentina Hewitson, 1866, Exot. Butt., III, Pl. *Liptena* and *Pentila*, figs. 8, 9.
Pseuderesia libentina Aurivillius, 1898, Rhop. Æthiop., p. 267.

A somewhat poorly preserved female taken at Medje about the middle of August is referable to this species. The type of *P.* (*Liptena*) *libentina* (Hewitson) is lost, and some years ago, when I consulted the collection of Hewitson in the British Museum, it had been replaced by two specimens of other species. The specimen from Medje, however, agrees so well with Hewitson's figure and other specimens referred to this species in the collections at Pittsburgh that there seems to be no doubt of the correctness of the determination.

Epitolinæ

Epitola Westwood

(337) 1. **Epitcla langi,** new species

Plate XII, Figure 10, ♂

♂. The fore wing acuminate at apex, slightly concave below the apex and a little rounded at the lower angle. Hing wing rounded externally, a trifle elongated. Thorax and abdomen black above, pale brown below. On the upper side both wings are dark brown, almost black, feebly revealing in certain lights a deep violet-blue sheen, especially on the disk of the primaries and the inner half of the secondaries. This color only reveals itself in a strong lateral light; in direct vision the wings appear to be almost uniformly dark brown or black. The cilia are concolorous. On the under side both wings are pale smoky brown, except on the inner margin of the primaries near the angle, where they are pale bluish gray, a shade or two lighter than the ground-color of the wings. About the end of the cell of the fore wing there is a vertical row of four small pale spots extending from the costa to the lower angle of the cell, and in the apical area of this wing there is a row of four or five similar spots just before the outer margin extending from the apex to the interval between veins 3 and 4, at the furthest. The hind wings on the lower side have a row of pale basal spots, three in number, quite small and faint. These are followed by a series of similar subbasal spots, which are also not conspicuous, but clearly defined. In the middle of the cell is a quadrate darker spot defined before and behind by thin pale lines, which I reckon as belonging to the subbasal series. Crossing the wing from the costa to the inner margin is a curved and twice dislocated line of small pale spots, two of which just at the end of the cell are the most conspicuous. This median row of small light spots is succeeded by a postmedian row, quite regularly curved and extending from the costa to the inner margin, a spot in each intraneural space. This row is in turn succeeded just before the margin by a regular row of submarginal spots somewhat crescentic in form. The cilia on the underside are dark as on the upper side. Expanse, 29 mm.

The type, which lacks antennæ and is in this respect defective, is unique. It was taken at Medje, August 19, 1910 and belongs to The American Museum of Natural History.

I dislike to found a new species upon a solitary defective specimen, but, after examining every picture of an *Epitola* which has been published and reading carefully every description which has been printed, I am convinced that the little butterfly before me has never been described or figured, at least not in such manner as to make either figure or description recognizable. The insect most nearly approaches *E. mangoënsis* Bethune-Baker (cf. Proc. Zool. Soc. London, 1908, Pl. VIII, fig. 6). The outline of the wings is the same, but the markings below differ. It is odd that the only specimen of the genus *Epitola* brought back from the Congo by the expedition should turn out to be hitherto nondescript. There are now nearly fifty species of the genus known from the region of which the Belgian Congo forms a part.

Lycæninæ

MEGALOPALPUS Röber

The separation of the African species under the generic name *Megalopalpus* Röber from the Asiatic forms, which have been described under the generic names *Gerydus* Boisduval and *Paragerydus* Distant is in the opinion of the writer a rather unnecessary refinement, based upon structural differences which are so microscopic as hardly to be worthy of regard. We are reaching a time when the discriminating instincts of authors, who carry on their labors with the help of compound microscopes, will demand the erection of a genus for every species, not only in entomology, but all the other zoological sciences.

The so-called "species" of *Megalopalpus* found in tropical Africa seem to the writer to be in a state of confusion at the present time. Aurivillius in his 'Rhopalocera Æthiopica,' p. 300, recognizes three species. The first is *M. zymna* (Westwood), originally figured in Doubleday and Hewitson's 'Genera of Diurnal Lepidoptera,' who in their plate represent a rather small insect, apparently belonging to the female sex, in which the posterior border of the secondaries is broadly margined with black. The second species recognized by Aurivillius is *M. simplex* Röber, in which the hind wings are more narrowly bordered with black and in which the markings of the under side of the wings are as described by Aurivillius in his analytical key. This species Aurivillius regards as having been redescribed by Capronnier under the name *bicoloraria*, and also redescribed by Kirby and refigured by Smith and Kirby under the specific name *similis*. The third species admitted by Aurivillius is *M. metaleucus* Karsch, which, according to Professor Aurivillius, is the insect figured as *M. zymna* by Smith and Kirby.

It happens that the present writer has before him a very large series of specimens of the genus from various parts of Africa where it is found. Over this mass of specimens he has long pored in the attempt to bring order out of what seems chaos. Every one of the forms admitted by Aurivillius to have specific rank is to be found in this series, but there are so many intergrading forms that it is impossible to decide where one species begins and the other ends. Of course, by selecting those which tally with the forms already named and described and destroying the rest, a semblance of specific security for these forms might apparently be produced. But such a procedure would not be scientifically honest. In the first place, there is great variability in size among specimens marked alike. Some are only 22 mm. in expanse, and they range through various measurements up to 45 mm. in expanse. Some have the outer margins of the secondaries heavily bordered with black; in other specimens the hind margins are altogether free from black on the margins; and there are intergrades between the two extremes. Some are absolutely free from markings of any kind whatever on the lower side of both primaries and secondaries; others are heavily marked, as described and figured by authors; and there is every grade of difference from those which are plain white on the under side to those which are figured as is the insect named *M. zymna* by Smith and Kirby and figured by them as such. Those with the light hind margins have the same maculation on the under side as those which have the heavy hind margins. Nothing is absolutely fixed, and there is no key to the puzzle, if regard be had to the maculation and markings of the wings. The fact is, I am convinced, that we are dealing here with a species characterized by great variability, both in size and markings. We have over one hundred specimens collected at one locality in the Cameroons during one summer. All of the so-called species are represented in the bunch, and the writer, if he were disposed to do so, might describe several others from the same catch, if he were willing to select some of the intergrading forms and dwell upon the presence or absence of this or that spot, or the slight variations in shade which occur. Differences are plainly and clearly distinguishable, but to the mind of the writer they do not show specific diversity. They represent merely individual variation, and he is inclined to the belief that the whole congeries of variant specimens are after all only referable to *M. zymna* (Westwood), a protean species. There are vastly more females than males in the collection and, strangely enough, a multitude of the females are greatly dwarfed, most of the specimens only measuring 22 mm. in expanse of wings, though some females, identically marked, are greatly hypertrophied. The insects are myrmecophilous, and perhaps some peculiarity in their mode of nutrition in the larval state, the relative ease or difficulty with which they secure their sustenance in this stage of their existence, may account for the very abnormal difference in the size of individuals. Until some observer carefully works out their life-history by breeding we shall not have a solution of the problem with which the present writer feels himself confronted.

(338) 1. **Megalopalpus zymna** (Westwood)

Miletus zymna WESTWOOD, 1852, in Doubleday and Hewitson, Gen. Diurn. Lep., II, p. 503, Pl. LXXVI, fig. 7.

(? *M. simplex* RÖBER, *M. bicoloraria* CAPRONNIER, *M. similis* KIRBY, *M. metaleucus* KARSCH, *M. zymna* SMITH and KIRBY.)

The collection contains three specimens, all females, taken at Medje, no two of which are exactly alike, though each of which can be matched in any large collection such as that in the possession of the writer. They are as follows.

a. ♀. Dwarfed, expanse 24 mm., markings of the under side as in *M. simplex*, but almost obsolete and so pale as only to be detected by close scrutiny. Like a score of specimens before the writer from Lolodorf, Cameroon. Taken at Medje, June 27, 1910.

b. ♀. Expanse 43 mm. Combining on under side characteristics of *M. simplex*, as defined by Aurivillius and shown in Röber's photograph, and characteristics of *M. zymna*, as depicted by Smith and Kirby = *M. metaleucus* Karsch, *fide* Aurivillius. On the upper side of the secondaries dark border reduced to a mere trace. Taken at Medje, September 27, 1910. Can be matched by numerous specimens in collection of writer, some with black hind borders on upper side of hind wings, some without such borders, some light on the under side, some dark, some fulvous, some slaty gray, as in Smith and Kirby's figure ('Afr. Lycænidæ,' Plate XII, figs. 1, 2).

c. ♀. Smaller than the preceding specimen. Expanse, 33 mm., with the hind margins of the secondaries much broader and darker than in that specimen, but the markings of the under side much paler, though closely resembling those of specimen *b.* Taken at Medje, August 1910.

LACHNOCNEMA Trimen

This is another myrmecophilous genus which stands in much need of intelligent revision. The writer has a mass of material at his command, collected in tropical East Africa and in tropical West Africa, as well as material received in the past from the late Dr. Roland Trimen, collected in the Transvaal. The study of this shows that there are either a number of closely related forms which have not been hitherto discriminated or that the species are remarkably variable. This is not, however, the place to take up the discussion of this subject.

(339) 1. **Lachnocnema reutlingeri** Holland

Lachnocnema reutlingeri Holland, 1893, Ann. Mag. Nat. Hist., (6) X, p. 286. Aurivillius, 1898, Rhop. Æthiop., p. 302, ♀.

Arrugia umbra Smith and Kirby, 1901, Rhop. Exot., III, Afr. Lycænidæ, p. 128, Pl. xxvii, figs. 5, 6, ♂.

The American Museum Congo Expedition brought back two males, neither very well preserved, which represent this species. We have in the Carnegie Museum fifty-five males and ten females, including the type of the species. The two specimens taken at Medje in July and August have been compared with these and they agree absolutely.

The writer has a suspicion that *L. luna* H. H. Druce (Proc. Zool. Soc. London, 1910, p. 368, Pl. xxxiv, fig. 5) is only a slight varietal form of this species, and that *L. magna* Aurivillius may only be an albinic female of the same insect. In fact, he has a specimen of a female in which the yellow color of the upper side is so pale that it might almost be termed white and which seems rather closely to agree with the descripion given by Dr. Aurivillius.

Deudorix Hewitson

(340) 1. **Deudorix elealodes** Bethune-Baker

Deudorix elealodes Bethune-Baker, 1908, Proc. Zool. Soc. London, p. 112, Pl. ix, fig. 6.

There are two somewhat imperfect male specimens of this pretty species taken at Medje, one in June, the other in August. As the author points out, the species is near to *D. eleala* Hewitson, from which, however, upon comparison it may be distinguished at a glance by the heavenly ultramarine blue of the upper surface, which strongly contrasts with the greenish blue ground-color of its ally, by the almost complete obsolescence of the lobe-spot on the under side of the hind wing, and by the much reduced width of the transverse lines on the under side of both wings.

(341) 2. **Deudorix batikelides,** new species

♂. Closely resembling *D. batikeli* Boisduval on the upper side, but with dark markings near the anal angle of the secondaries less prominent. On the under side lacking altogether the three basal spots which are conspicuous upon the secondaries of Boisduval's species, and with the wings throughout evenly pale warm gray, with the tranverse lines and markings only a little lighter than the ground-color. These markings recall in their disposition those of certain oriental Lycænidæ belonging to the genus *Lampides*.

♀. Like the male, but with the blue of the discal areas of both wings reduced in extent, due to the widening of the dark costal and outer marginal areas of black on both wings.

Type ♂ taken at Niangara, November 1910; allotype ♀ taken at Mombasa, E. Africa by William Doherty, and in Holland Collection, Carnegie Museum.

I am under the impression that this is the form which has in the past been referred by some authors to the species *D. batikeli*, and reported as such from various points on the East African mainland. *D. batikeli* is found on the island of Madagascar.

I have for a number of years had a small but very fine series of this insect collected for me on the hills about twelve miles up from the coast back of Mombasa by the late William Doherty. They have puzzled me, because, while resembling *D. batikeli*, they could not be found to agree with either figures or descriptions or actual specimens from Madagascar and were labelled "? *batikeli* Bsd." The occurrence in the collection upon which I am reporting of a good male specimen, picked up at Niangara in November 1910, brings matters to a focus, and I venture to give a name to this insect, which I am sure is not the same as the insect named by Boisduval and which apparently has been overlooked by other students.

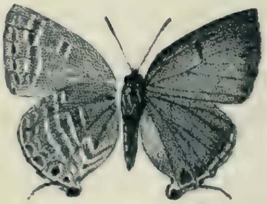


Fig. 1. *Deudorix batikelides* Holland. ♀ (Nat. size). Drawn from specimen taken at Mombasa.

(342) 3. **Deudorix antalus** (Hopffer)

Dipsas antalus Hopffer, 1855, Monatsber. Akad. Wiss. Berlin, p. 641.

Sithon antalus Hopffer, 1862, Peters, Reise n. Mossambique, Ins., p. 400, Pl. xxxv, figs. 7–9.

Deudorix antalus Aurivillius, 1898, Rhop. Æthiop., p., 309.

One female of this widely distributed species taken at Faradje, January 11, 1912.

OXYLIDES Hübner

(343) 1. **Oxylides homeyeri** (Dewitz)

Plate XII, Figure 5, ♀

Hypolycæna homeyeri Dewitz, 1879, Nov. Act. Acad. Nat. Cur., XLI, part 2, p. 206, Pl. xxvi, fig. 13.

Oxylides homeyeri Aurivillius, 1898, Rhop. Æthiop., p. 313.

There is one female specimen in moderately good condition, taken at Medje, July 20, 1910. As this sex of the insect has never heretofore been described, unless, as Aurivillius suggests, *O. melanomitra* Karsch be it, I venture to briefly gives its characteristics.

♀. On the under side apparently agreeing completely with the description and figure given by Dewitz (*loc. cit.*). On the upper side the ground-color is gray laved with lilac, especially on the cells and discal areas of both wings. The costa and outer margin of the front wings are darker, and on the hind wings there is just below the upper angle a dark spot or band of limited size, which is darker than the rest of the wing. The lower end of the hind wing is broadly white on this side, with the three marginal spots standing out conspicuously upon the light ground. On the under side the anal angle and the adjacent parts of the wing are somewhat broadly laved with yellow, which is also the case in the male.

HYPOLYCÆNA Felder

(344) 1. **Hypolycæna hatita** Hewitson

Hypolycæna hatita HEWITSON, 1865, Ill. Diurn. Lep., Lycænidæ, p. 51, Pl. XXXIII, figs. 21–24. AURIVILLIUS, 1898, Rhop. Æthiop., p. 315.

There are eighteen males and one female of this insect, all in more or less damaged condition, as is usually the case with them when received from collectors. It appears to be almost impossible to preserve the long narrow tails with which the hind wings of the species of this genus are adorned. I have hundreds of them, and none seem to be absolutely perfect. All of the specimens returned by the expedition were taken at Medje on dates ranging from March to September, except two, one of which was caught at Risimu in September 1909. and the other at Gamangui on June 14, 1910.

(345) 2. **Hypolycæna antifaunus** (Doubleday and Hewitson)

Iolus antifaunus DOUBLEDAY AND HEWITSON, 1852, Gen. Diurn. Lep., II, p. 481, Pl. LXXV, fig. 1.

Hypolycæna antifaunus AURIVILLIUS, 1898, Rhop. Æthiop., p. 315.

There are four damaged specimens of this species all captured at Medje, one in April, the other three in July.

(346) 3. **Hypolycæna dubia** Aurivillius

Hypolycæna dubia AURIVILLIUS, 1895, Ent. Tidskr., XIV, p. 211.

This is indeed a very dubious species, as its name implies. It is probably only a seasonal variety, or local race of *H. lebona* Hewitson, characterized by being a somewhat brighter blue on the upper side of the fore wings, and having a wider inward extension toward the cell of the light color of the inner margin. It is a very common insect in Cameroon and on the Ogové River, and I have hundreds of specimens, both males and females, of *H. lebona* and *H. dubia*, and while the diacritical points emphasized by Aurivillius hold well enough in many cases, so that it is possible to make up a good series of both forms, there are many intergrading forms which suggest that we may well be in doubt as to the validity of the species as such.

The collection contains a male and female in fairly good preservation taken at Medje.

(347) 4. **Hypolycæna liara** H. H. Druce

Hypolycæna liara H. H. Druce, 1890, Ann. Mag. Nat. Hist., (6) V, p. 27. Aurivillius, 1898, Rhop. Æthiop., p. 316.

A male and a female were captured, the former at Niangara in November, the latter at Medje in June.

APHNÆUS Hübner

(348) 1. **Aphnæus orcas** (Drury)

Thecla orcas Drury, 1782, Ill. Exot. Ent., III, p. 46, Pl. xxxiv, figs. 2, 3.
Aphnæus orcas Holland, 1893, Ent. News, IV, Pl. i, fig. 13. Aurivillius, 1898, Rhop. Æthiop., p. 327.

Six males, one taken at Lubila, September 1909, four at Medje from April to September, and one at Niangara in November 1910.

SPINDASIS Wallengren

(349) 1. **Spindasis natalensis** (Hewitson)

Aphnæus natalensis Hewitson, 1865, Ill. Diurn. Lep., Lycænidæ, p. 62, Pl. xxv, figs. 1, 2.
Aphnæus caffer Trimen, 1868, Trans. Ent. Soc. London, p. 88.

The specimens have been compared with others named *Aphnæus caffer* and obtained from Mr. Trimen himself in exchange. They agree perfectly with these. Aurivillius sinks the name *caffer* as a synonym of *mozambica* Bertolini, but I am unable to identify the reference given by Aurivillius in the 'Rhopalocera Æthiopica,' though I have made diligent search.

The expedition brought back five specimens, a male caught at Medje in August, a pair taken at Niangara in November, and two males captured at Faradje, one in December 1910, the other in "1911–1912."

(350) 2. **Spindasis crustaria** (Holland)

Aphnæus crustaria Holland, 1890, Psyche, V, p. 420; 1893, Ent. News, IV, p. 28, Pl. i, fig. 10.
Spindasis crustaria Aurivillius, 1898, Rhop. Æthiop., p. 332.

There is one somewhat damaged female taken at Medje about the middle of July.

(351) 3. **Spindasis aderna** (Plœtz)

Plate XII, Figure 4, ♂

Zeritis aderna PLŒTZ, 1880, Stett. Ent. Zeit., XLI, p. 203, ♂ and ♀.
Zeritis latifimbriata E. SHARPE, 1890, Ann. Mag. Nat. Hist., (6) VI, p. 105; 1890, Trans. Ent. Soc. London, Pl. XVII, fig. 5, ♀.
Spindasis aderna AURIVILLIUS, 1898, Rhop. Æthiop., p. 332.

One male in not very good condition taken at Niangara about the middle of November 1910. It agrees on the under side with a female long in my possession, which was captured by the late Dr. A. C. Good on the Ogové River thirty years ago. I once took this specimen with me to London and it was examined by Miss Sharpe, who agreed with me in my identification of it as her species *latifimbriata*. Aurivillius sinks *S.* (*Zeritis*) *fallax*, ♂, (Sharpe), as synonym of *aderna* Plœtz. I am quite sure he is in error. *Z. fallax* Sharpe is bright blue on the upper side of the wings, while *S. aderna* in the male sex resembles *Axiocerses perion* (*harpax*), as Plœtz, the author of the species, points out in his description. The specimen before me accords with what Plœtz says and might easily be mistaken by a novice for a specimen of *A. harpax* upon casual inspection. Plœtz states in his paper that he had male and female before him. The male of *S. aderna* on the upper side is dark red and not blue, and Miss Sharpe's blue species is distinct, in spite of the superficial resemblance of the insect on the under side to that named by Plœtz.

(352) 4. **Spindasis chapini,** new species

Plate XII, Figure 6, ♂

♂. Frons reddish; a tuft of white hairs at the base of each antenna; antennæ black, short, with a moderately long spindle-shaped club, as in other species of the genus; eyes dark brown, completely encircled with a ring of white scales; terminal joint of palpi black, second and third joints heavily clothed with long vermilion colored scales. Thorax and abdomen black above, deep orange-red inclining to vermilion below. Legs with the femora and tibiæ dark brown dorsally, pale red below, at their point of union with the thorax surrounded by a ring of tuft-like white hairs, which is again encircled outwardly by a ring of long jet-black hairs. The fore wing on the upper side is uniformly dark brown or sepia, except for a few dark orange-red scales just before the hind angle, arranged to form a subtriangular spot, more or less ill-defined. The hind wings above are of the same ground-color as the fore wings, but about the middle of the discal area they are darker, being clothed with black velvety scales. The entire inner margin is laved with deep orange-red, and this color is extended over the whole posterior extremity of the wing, and along the outer margin upward as a narrowing line to the extremity of vein 3. The dark brown cilia define this pale area as a fine marginal band. The anal lobe is black at the end; the two tails, one at the end of vein 1, which is twice as long as the one at the end of vein 2, are very slender, and appear under the microscope to be dark red, heavily dusted with black scales. On the under side the ground-color of both wings is very deep orange-red or vermilion. The fore wings on their posterior margin are pale fuscous from the base, as far upward as the first submedian nervule and as far outward as a point about two millimeters from the lower angle, where this dark shade vanishes and is replaced by pale yellow. There is a small sharply defined black spot in the cell of the fore wing at its base, followed about the middle by two similar spots, one above the other, and succeeded immediately at the end of the cell by three such spots fused together to form a moniliform dark bar closing the cell. The hind wings on this side are devoid of dark markings, except on the inner margin a little above the anal lobe, where there is an elongated subtriangular spot of small size, which is deep black, ornamented in the middle by a narrow streak of silvery white scales. The anal lobe is black ornamented with a few metallic scales. On this, as on the upper side of the wings, the cilia are dark brown and define the wings outwardly as a narrow marginal line. Expanse, 28 mm.

There are two males, both captured at Niangara in November 1910. One, the type, is in The American Museum of Natural History; the other, the paratype, is in the Holland Collection in the Carnegie Museum. I take pleasure in naming the species in honor of one of the leaders of the expedition.

Axiocerses Hübner

(353) 1. **Axiocerses harpax** (Fabricius)

Papilio harpax Fabricius, 1775, Syst. Ent., App., p. 829, ♀.
Chrysophanus perion Hopffer, 1862, Peters, Reise n. Mossambique, Ins., p. 403, Pl. xxvi, figs. 1–3.
Axiocerses harpax Aurivillius, 1898, Rhop. Æthiop., p. 335.

There are three males taken at Medje which are clearly referable to this species. One was captured in June, the other two in July.

I confess with Dr. Aurivillius my inability to distinguish clearly specimens of so-called *A. perion* (Cramer) which we now and then receive from correspondents in South and Eastern Africa from *A. harpax* (Fabricius). Except that they are darker on the under side, so far as my specimens show, there is no difference which should cause them to be regarded as a distinct species. They seem to me at best to be a mere local race. However, the whole genus is in need of revision, as a number of species have recently been described.

CUPIDESTHES Aurivillius

(354) 1. **Cupidesthes thyrsis** (Hewitson)

Lycænesthes thyrsis HEWITSON, 1878, Ill. Diurn. Lep., Lycænidæ, p. 224, Pl. XCII, figs. 42–44. AURIVILLIUS, 1898, Rhop. Æthiop., p. 349.

Cupidesthes thyrsis BETHUNE-BAKER, 1910, Trans. Ent. Soc. London, p. 10, Pl. IV, fig. 3, genitalia.

One male of this species, which is very common in Cameroon and the valley of the Ogové, was captured at Niangara toward the end of November 1910.

LYCÆNESTHES Moore

(355) 1. **Lycænesthes musagetes** Holland

Lycænesthes musagetes HOLLAND, 1893, Ent. News, IV, p. 25. AURIVILLIUS, 1898, Rhop. Æthiop., p. 349. BETHUNE-BAKER, 1910, Trans. Ent. Soc. London, p. 21.

Seven males, one taken at Avakubi, October 3, 1909, the rest at Medje, the dates of capture ranging from April to August.

(356) 2. **Lycænesthes ituria** Bethune-Baker

Lycænesthes ituria BETHUNE-BAKER, 1910, Trans. Ent. Soc. London, p. 22, Pl. I, fig. 4; Pl. V, fig. 6.

I refer one badly damaged male taken at Medje, June 26, to this species, with the figure and description of which it agrees closely, though somewhat under the size of the specimen figured by the author of the species.

(357) 3. **Lycænesthes lunulata** Trimen

Lycænesthes lunulata TRIMEN, 1894, Proc. Zool. Soc. London, p. 51, Pl. VI, fig. 12. (For synonymy consult Bethune-Baker, 1910, Trans. Ent. Soc. London, p. 40.)

One male captured at Faradje in December 1912.

(358) 4. **Lycænesthes silvanus** (Drury)

Papilio silvanus DRURY, 1773, Ill. Exot. Ent., II, p. 5, Pl. III, figs. 2, 3. (For synonymy consult Bethune-Baker, 1910, Trans. Ent. Soc. London, p. 43.)

The collection contains eight males, one taken at Lubila in September 1909, one at Niangara in November, and the rest at Medje from May to August 1910.

All of the specimens differ from examples from tropical West Africa (Sierra Leone, Cameroon, the valley of the Ogové) with which I have compared them in the fact that the dark markings on the under side of the wings do not contrast as strongly with the ground-color as in the specimens from the west coast. It is true that none of the specimens are in the best condition, and all are somewhat rubbed, but in spite of this it is evident that they all show a tendency on the under side to a loss of the distinctness of the maculation and a toning down in the direction of uniformity of surface which causes them to stand in contrast to a series of specimens from farther west. The markings are identical, in their form, but the dark bands and spots are only a few shades darker than the ground-color. The fact is worthy of note.

(359) 5. **Lycænesthes larydas** (Cramer)

Papilio larydas CRAMER, 1780, Pap. Exot., III, p. 160, Pl. cclxxxii, fig. 6.

(For further synonymy consult Bethune-Baker, 1910, Trans. Ent. Soc. London, p. 44.)

The collection comprises twelve males, one taken at Stanleyville in September 1909, the rest at Medje from June to September 1910.

(360) 5*a*. **Lycænesthes larydas kersteni** Gerstæcker

Lycænesthes larydas var. *kersteni* GERSTÆCKER, 1871, Archiv f. Naturg., XXXVII, p. 359; idem, 1873, Von der Decken's Reise, III, p. 373, Pl. xv, fig. 5.

Three males of this form taken at Faradje in December 1912. There is a marked difference between the specimens of *L. larydas* coming from the hot valleys and woodlands of the western part of its range and those from the eastern parts of the African continent. The latter, to which Gerstæcker gave the name cited above, are always paler blue on the upper side, and distinctly paler below. The difference is hardly specific, but is an illustration, one of many, showing that climatic and other influences are at work in producing variations on the two sides of the continent.

(361) 6. **Lycænesthes lachares** Hewitson

Lycænesthes lachares HEWITSON, 1878, Ill. Diurn. Lep., Lycænidæ, p. 225, Pl. xci, figs. 33, 34.

(For synonymy consult Bethune-Baker, 1910, Trans. Ent. Soc. London, p. 47.)

One female taken at Medje, July 5, 1910.

(362) 7. **Lycænesthes rufomarginata** Bethune-Baker

Lycænesthes rufomarginata BETHUNE-BAKER, 1910, Trans. Ent. Soc. London, p. 54, Pl. ii, fig. 14; Pl. ix, fig. 26.

One male captured at Medje, April 5, 1910.

(363) 8. **Lycænesthes makala** Bethune-Baker

Lycænesthes makala BETHUNE-BAKER, 1910, Trans. Ent. Soc. London, p. 58, Pl. ii, fig. 16; Pl. ix, figs. 27, 28.

One male taken at Medje about the middle of July.

(364) 9. **Lycænesthes scintillula** Holland

Lycænesthes scintillula HOLLAND, 1891, Psyche, VI, p. 50. SMITH AND KIRBY, 1893, Rhop. Exot., Afr. Lycænidæ, p. 98, Pl. XXII, figs. 3, 4. BETHUNE-BAKER, 1910, Trans. Ent. Soc. London, p. 60, Pl. III, fig. 3; Pl. X, figs. 30, 31.

Three males taken at Medje, one in each of the months, May, June, and July.

(365) 10. **Lycænesthes pyroptera** Aurivillius

Lycænesthes pyroptera AURIVILLIUS, 1895, Ent. Nachr., XXI, p. 382; 1899, Rhop. Æthiop., p. 352, Pl. VI, fig. 3. BETHUNE-BAKER, 1910, Trans. Ent. Soc. London, p. 61.

One male taken at Stanleyville, September 5, 1909. The specimen agrees absolutely with the description and figure given by Aurivillius.

TRICLEMA Karsch

(366) 1. **Triclema lutzi,** new species

Plate XII, Figure 2, ♂

♂. Near *T. rufoplagata* Bethune-Baker (cf. Trans. Ent. Soc. London, 1910, p. 72, Pl. III, fig. 8) but considerably smaller in size, and differently marked. The thorax and abdomen are black above, pale chestnut below. The chestnut area of the fore wings, which in *rufoplagata* is small and confined to the immediate region about the origin of veins 2 and 3, is in *T. lutzi* extended so as to cover the greater part of the discal area, only the base, the costa, and a broad marginal band remaining dark in color. At the end of the cell, which in its lower half is distally invaded by the chestnut color, there is a narrow black vertical bar, which merges into the dark costal area. The secondaries are very dark brown (sepia) almost black, with a fine light line followed by a very thin black line on the outer border, the fine dark line showing against the light line within, and the paler cilia. There is an imperfect ocellus at the anal angle and a more regularly formed ocellus in the space between veins 2 and 3 at their extremities. These eye-spots are defined inwardly by a few scales slightly lighter than the rest of the wing. On the under side the ground-color of the wings is moderately dark brownish fuscous, crossed by darker lines and bands, which are defined more or less clearly on either side by lighter lines. The costa of the primaries at the base is black for a short distance, there is a light line following, and distally a rather prominent black triangular spot with its apex pointing toward the costa; there is a dark vertical bar near the end of the cell, defined inwardly and outwardly by paler lines; the median transverse line is curved somewhat irregularly, and widens and grows blacker as it approaches the inner margin; the postmedian macular band is widest and darkest between veins 3 and 5; the submarginal band is accentuated by black spots before the apex in spaces 6 and 7; there is a thin light line just before the equally thin dark marginal line which latter is clearly defined against the rather light colored cilia. The hind wings below have several dark basal and subbasal short transverse spots. At the end of the cell is a double bar of dark color defined by paler lines before and behind; the median band, which runs from the costa to the inner margin in an irregular curve is accentuated at the middle of the costa by a dark quadrate spot and terminates on the inner margin in the usual V-shaped spot; the postmedian macular band is darkest and broadest opposite the end of the cell, and is edged inwardly and outwardly by lighter lines; the submarginal line which is somewhat irregularly curved is thinner and not as conspicuous as the other lines; it is succeeded just before the margin by a series of semilunate darker spots in the interspaces from the upper angle as far down as vein 3; between veins 2 and 3 there is a conspicuous ocellus, defined above and on the sides, but not outwardly, by red. The pupil is deep black irrorated with a few bright metallic blue scales; at the inner angle there is an imperfectly formed ocellus, red above, pupilled with black, and dusted with a few bright scales. The marginal line is thin and dark and contrasts against the paler shade within and the lighter cilia without. Expanse, 16–20 mm.

The collection contains three specimens, all caught at Medje, one in April, one in June, and one in July. They are males. The type and a paratype are in The American Museum of Natural History, one paratype is in the Holland Collection in the Carnegie Museum. I take pleasure in naming this species in honor of the amiable curator of the entomological collections of the American Museum.

PHLYARIA Karsch

(367) 1. **Phlyaria cyara** (Hewitson)

Lycæna cyara HEWITSON, 1876, Exot. Butt., V, *Lycæna*, Pl. I, figs. 9, 10.
Phlyaria cyara KARSCH, 1895, Ent. Nachr., XXI, p. 303.
Cupido phlyaria AURIVILLIUS, 1898, Rhop. Æthiop., p. 358.

There are two males, one caught at Risimu in September 1909, the other at Medje in July 1910. The insect is not uncommon in the interior of Cameroon, but I have never seen a female and this sex seems, so far as I can now recall, never to have been thus far described.

(368) 2. **Phlyaria heritsia** (Hewitson)

Lycæna heritsia HEWITSON, 1876, Exot. Butt., V, *Lycæna*, Pl. I, figs. 11, 12.
Hyreus virgo BUTLER, 1896, Proc. Zool. Soc. London, p. 121, Pl. VI, fig. 1, ♀.
Cupido heritsia AURIVILLIUS, 1898, Rhop. Æthiop., p. 359.

Five males, one taken at Bafwasende, September 23, 1909, the rest at Medje from April to September.

URANOTHAUMA Butler

(369) 1. **Uranothauma falkensteini** (Dewitz)

Plebeius falkensteini DEWITZ, 1879, Nov. Act. Acad. Nat. Cur., XLI, part 2, p. 205, Pl XXVI, fig. 5.
Cupido falkensteini AURIVILLIUS, 1898, Rhop. Æthiop., p. 360.

Four males captured at Medje, June, August, and September.

CASTALIUS Hübner

(370) 1. **Castalius carana** (Hewitson)

Lycæna carana HEWITSON, 1876, Exot. Butt., V, *Lycæna*, Pl. I, fig. 6.
Cupido carana AURIVILLIUS, 1898, Rhop. Æthiop., p. 364.

This species, which is quite common in Cameroon and the valley of the Ogové, was taken in some numbers by the expedition at Medje, where twenty-three specimens were taken, the dates of capture ranging from July to September. There is also a specimen taken at Bafwabaka, January 7, and one caught at Gamangui on February 1, 1910. Some of the females are tinged with yellowish.

The species must not be confounded with *C. margaritaceus* Em. Sharpe, paratypes of which are in the writer's collection, and which it superficially resembles.

(371) 2. **Castalius isis** (Drury)

Papilio isis DRURY, 1773, Ill. Exot. Ent., II, p. 6, Pl. III, figs. 4, 5.
Cupido isis AURIVILLIUS, 1898, Rhop. Æthiop., p. 365.

The female of this pretty insect seems not to have been described hitherto. As there is one example of this sex in the collection I may say that there is no difference in the form of the markings to distinguish it from the males but that all the bands and spots instead of being brilliant blue as in the male, are blackish in the female, there being only a faint trace of the blue color in this sex at the bases of the fore and hind wings.

The collection contains twenty-four males and one female. Most of them were taken at Medje from April to September, but two or three were captured at Gamangui in February and June, and several at Niangara in November 1910.

TARUCUS Moore

(372) 1. **Tarucus telicanus** (Lang)

Papilio telicanus LANG, 1789, Verzeichniss meiner Schmetterlinge, part 2, p. 47.
Hesperia (*Rurales*) *plinius* FABRICIUS, 1793, Ent. Syst., III, part 1, p. 284.
Cupido telicanus var. *plinius* AURIVILLIUS, 1898, Rhop. Æthiop., p. 364.

There are three males and one female. One of the males was caught at Niangara, the rest were taken at Medje in July and August.

AZANUS Moore

(373) 1. **Azanus mirza** (Plœtz)

Lycæna mirza PLŒTZ, 1880, Stett. Ent. Zeit., XLI, p. 203.
Cupido mirza AURIVILLIUS, 1898, Rhop. Æthiop., p. 366.

The species is represented in the collection by thirty-one specimens, twenty-six taken at Gamangui in February, three at Medje, one in each of the months, June, July, and September, one at Bafwabaka in December 1909, and one at Faradje, labelled "1911–1912."

NACADUBA Moore

(374) 1. **Nacaduba æthiops** (Mabille)

Kharsanda æthiops MABILLE, 1877, Bull. Soc. Zool. France, II, p. 219.
Nacaduba stratola HOLLAND, 1891, Psyche, VI, p. 52.
Cupido æthiops AURIVILLIUS, 1898, Rhop. Æthiop., p. 367.

There are thirteen males, eleven caught at Gamangui in February, the other two at Medje in July 1910.

POLYOMMATUS Moore

(375) 1. **Polyommatus bæticus** (Linnæus)

Papilio bæticus LINNÆUS, 1767, Syst. Nat., 12th Ed., p. 789.
Cupido bæticus AURIVILLIUS, 1898, Rhop. Æthiop., p. 367.

Two males, one caught at Medje in August 1910, the other labelled "Faradje, 1911–1912."

CUPIDO Schrank

(376) 1. **Cupido asopus** (Hopffer)

Lycæna asopus HOPFFER, 1855, Monatsber. Akad. Wiss. Berlin, p. 642.
Cupido asopus AURIVILLIUS, 1898, Rhop. Æthiop., p. 373. (As synonym of *C. malathana* Boisduval.)

Two damaged specimens, a male taken at Bafwabaka, December 1909, and a female caught at Medje, July 1910.

Aurivillius sinks *asopus* Hopffer as a synonym of *C. malathana* Boisduval, but I cannot bring myself to agree with him, in the light of the material before me, which I believe to be correctly identified. As species go in this group, there seem to be reasons for regarding the two as distinct. But I will not discuss the matter except to say that the form *malathana* from Madagascar is in my opinion at least a well-marked insular variety and easily separable from the continental form *asopus*.

(377) 2. **Cupido osiris** (Hopffer)

Lycæna osiris HOPFFER, 1855, Monatsber. Akad. Wiss. Berlin, p. 622.
Cupido osiris AURIVILLIUS, 1898, Rhop. Æthiop., p. 374.

There are four males, all taken at Faradje, one without date, one caught in December 1912, and two labelled "1911–1912." Besides, there is a dwarfed female captured, according to the label, at Bumba, July 1909.

(378) 3. **Cupido patricia** (Trimen)

Lycæna patricia TRIMEN, 1881, S. Afr. Butt., II, p. 20.
Cupido patricia AURIVILLIUS, 1898, Rhop. Æthiop., p. 374.

There are eight specimens, one male, and seven females; one female taken at Kwamouth, July 1909, the rest at Niangara in November 1910. They have been carefully compared with specimens of *C.* (*Lycæna*) *patricia* (Trimen), received from Mr. Trimen, the author of the species, and appear to agree with them. I may say, in passing, that I think that the species represents a varietal form of *C. parsimon* (Fabricius) and it is hard to define the difference between the two forms without very carefuly scrutiny.

CUPIDOPSIS Karsch

(379) 1. **Cupidopsis hippocrates** (Fabricius)

Hesperia (*Rurales*) *hippocrates* FABRICIUS, 1793, Ent. Syst., III, part 1, p. 288.
Cupido hippocrates AURIVILLIUS, 1898, Rhop. Æthiop., p. 376.
Cupidopsis hippocrates NEAVE, 1910, Proc. Zool. Soc. London, p. 601.

Two males taken at Medje in August 1910.

I follow Neave in referring this species to the genus *Cupidopsis* Karsch, the type of which is *C. jobates*. It might as well be placed here as anywhere, unless a new genus be erected for its reception. In its markings it shows little resemblance to *C. jobates*, but structurally it is very close to that species. The female is figured in Mabille's work on the Lepidoptera of Madagascar, included in Grandidier's magnificent series of volumes on the natural history of that island. It differs from the male in lacking the white at the apices of the fore wings, and in having the hind border of the secondaries narrowly margined with white upon which the marginal ocelli are conspicuous. I have an extensive series of this species from various parts of Africa, west, east, and south.

EVERES Hübner

(380) 1. **Everes togara** (Plœtz)

Lycæna togara PLŒTZ, 1880, Stett. Ent. Zeit., XLI, p. 202.
Cupido micylus var. *togara* AURIVILLIUS, 1898, Rhop. Æthiop., p. 377.

This species, which is common in Cameroon and the valley of the Ogové, is represented in the collection by three tattered specimens, a male taken at Medje in September and two females caught at Medje, one in April, the other in August.

Aurivillius regards this insect as a varietal form of *E. micylus* (Cramer) but Mr. Bethune-Baker informs me that a careful study of the genitalia made by him reveals that *togara* (Plœtz) is specifically distinct from *micylus* (Cramer).

ZIZERA Moore

(381) 1. **Zizera antanossa** (Mabille)

Lycæna antanossa MABILLE, 1877, Ann. Soc. Ent. France, (3) VII, Bull., p. 72.
Cupido antanossa AURIVILLIUS, 1898, Rhop. Æthiop., p. 378.
Zizera antanossa BUTLER, 1900, Proc. Zool. Soc. London, p. 100, Pl. XI, figs. 14, 15.

Two poorly preserved males taken at Faradje, one without date, the other labelled "1911-1912."

(382) 2. **Zizera gaika** (Trimen)

Lycæna gaika TRIMEN, 1862, Trans. Ent. Soc. London, p. 403.
Cupido gaika AURIVILLIUS, 1898, Rhop. Æthiop., p. 378.
Zizera gaika BUTLER, 1900, Proc. Zool. Soc. London, p. 109.

One male taken at Bumba, July 29, 1909.

(383) 3. **Zizera lysimon** (Hübner)

Papilio lysimon HÜBNER, 1798-1803, Europæische Schmett., figs. 534, 535.
Cupido lysimon AURIVILLIUS, 1898, Rhop. Æthiop., p. 379.
Zizera lysimon BUTLER, 1900, Proc. Zool. Soc. London, p. 108, Pl. XI, fig. 9.

Two specimens captured at Freetown, Sierra Leone, July 14, 1909.

OBORONIA Karsch

(384) 1. **Oboronia plurilimbata** (Karsch)

Thermoniphas plurilimbata KARSCH, 1895, Ent. Nachr., XXI, p. 303.
Cupido plurilimbata AURIVILLIUS, 1898, Rhop. Æthiop., p. 380.

Three males taken at Medje, one in April, one in August, and one in September. They agree completely with the description given by Karsch, and I refer them to his species, of which no figure has been published, so far as I can recall.

(385) 2. **Oboronia punctata** (Dewitz)

Plebeius punctatus DEWITZ, 1879, Nov. Act. Acad. Nat. Cur., XLI, part 2, p. 205, Pl. XXVI, fig. 15.
Cupido punctatus AURIVILLIUS, 1898, Rhop. Æthiop., p. 381.

One male caught at Munie Katoto, September 10, 1909.

This is a very common species in southern Cameroon and the valley of the Ogové.

(386) 3. **Oboronia ornata** (Mabille)

Lycæna ornata MABILLE, 1890, Ann. Soc. Ent. France, (6) X, p. 24, Pl. II, fig. 6.
Cupido ornatus AURIVILLIUS, 1898, Rhop. Æthiop., p. 381.

Three specimens taken at Medje, two in April, one in June.

Like the foregoing, this is a very common insect in southern Cameroon and the valley of the Ogové River. We have in the Museum at Pittsburgh more than one hundred examples, including the slight varietal form named *vestalis* by Aurivillius, in which the hind marginal band of the secondaries is broader than in the type figured by Mabille, and several specimens in which the white areas of the wings are broadly beautiful straw-yellow. To this yellow form, which has not heretofore been described or figured, I apply the varietal name **flava**. The type is in the Holland Collection in the Carnegie Museum and, with several cotypes, was taken at Benito, Spanish Guinea, by the late Dr. A. C. Good.

In this connection I may state that this insect is the one to which the Fabrician name *elorea* has in the past been applied by authors. The Fabrician description, like many of those given by early authors, is too brief and concise to enable a student to reach a proper conclusion. The only figure of *elorea* is given by Donovan in the 'Naturalist's Repository,' Pl. LIII, in reference to which Aurivillius makes the comment that it may be "*species fictitia.*" I confess that among the hundreds of specimens of this genus I have had in my hands I have never found one to agree with Donovan's figure, and that I share in the view of Aurivillius that if it is *elorea* Fabricius, the species is now probably extinct, if indeed it ever existed.

Papilionidæ

Pierinæ

LEPTOSIA Hübner

(387) 1. **Leptosia medusa** (Cramer)

Papilio medusa CRAMER, 1777, Pap. Exot., II, p. 86, Pl. CL, fig. *F*.
Leptosia medusa AURIVILLIUS, 1898, Rhop. Æthiop., p. 387.

Eight specimens, one taken at Bafwasende in January, one at Gamangui in February, the rest at Medje in July and August.

(388) 1*a*. **Leptosia medusa immaculata** (Aurivillius)

Nychitona medusa immaculata AURIVILLIUS, 1895, Ent. Tidskr., XVI, p. 257.
Leptosia medusa ab. *immaculata* AURIVILLIUS, 1910, Seitz, Gross-Schmett., XIII, p. 31, Pl. X*a*.

Three examples, one taken at Ngayu in April, one at Medje in August, and one at Niangara in November.

(389) 2. **Leptosia nupta** (Butler)

Nychitona nupta BUTLER, 1873, Cist. Ent., I, p. 175.
Leptosia nupta AURIVILLIUS, 1910, Seitz, Gross-Schmett., XIII, p. 31, Pl. x*b*.

Twenty-two specimens, of which all were captured at Medje except two caught at Gamangui in February and one in June. The specimens from Medje were mostly taken in June, but there are individuals labelled as captured there in every month from March to August inclusive.

MYLOTHRIS Hübner

(390) 1. **Mylothris chloris** (Fabricius)

Papilio chloris FABRICIUS, 1775, Syst. Ent., p. 473.
Mylothris chloris AURIVILLIUS, 1910, Seitz, Gross-Schmett., XIII, p. 32, Pl. x*d*.

A male and a female taken at Niangara in November, and another female caught at Faradje "1911–1912."

(391) 2. **Mylothris sjöstedti** Aurivillius

Mylothris sjöstedti AURIVILLIUS, 1895, Ent. Tidskr., XVI, p. 260, Pl. III, fig. 2; 1910, Seitz, Gross-Schmett., XIII, p. 33, Pl. XI*a*.

I refer to this species a single male, taken at Medje, August 24, 1910. It differs somewhat from the type, in that the blue-gray color extends from the base of the fore wing almost entirely over the wing, and is not restricted to its basal area. In other respects it agrees entirely with the figures and descriptions given by the author of the species.

(392) 3. **Mylothris spica** (Mœschler)

Tachyris spica MŒSCHLER, 1883, Verh. zool.-bot. Ges. Wien, XXXIII, p. 277, ♂.
Papilio rhodope DONOVAN, 1824, Naturalist's Repository, III, Pl. LXXXVI (*non rhodope* Fabricius), ♀.
Mylothris spica AURIVILLIUS, 1910, Seitz, Gross-Schmett., XIII, p. 33, Pl. x*d*, ♂.

There has existed some confusion as to this species. I have in my possession a long series of males and females collected for me by the late Dr. A. C. Good in the valley of the Ogové River. A number of pairs were taken *in coitu*. This series shows clearly that the insect, which was in 1883 described by Mœschler under the name *spica*, is the male of the butterfly which Donovan in 1824 figured as the female of *P. rhodope* Fabricius, which it is not. For the form figured by Donovan I now propose the name **donovani** to distinguish it from other female forms of the same species. Besides the females belonging to this varietal form there are numerous other females, also taken *in coitu* with males of *M. spica*, in which the marginal borders more nearly resemble those of *M. poppea* (Cramer). In these, however, the fore wings are either white or very faintly laved with yellow. The females of this species are therefore polymorphic.

In the Lang-Chapin Collection there is only one female which belongs to the form *M. donovani* Holland. It was taken at Niangara in November. There are twenty-seven males of typical *spica*, one captured at Kwamouth in July 1909, another at Avakubi in October 1909, a couple at Gamangui in June, and the rest at Medje in June, July, and August 1910.

(393) 4. **Mylothris sulphurea** Aurivillius

Mylothris sulphurea AURIVILLIUS, 1895, Ent. Tidskr., XVI, p. 259, Pl. III, fig. 3; 1910, Seitz, Gross-Schmett., XIII, p. 33, Pl. x*f*.

Six males and two females, all taken at Medje, except one male caught at Munie Katoto in September. The specimens from Medje were taken from June 20 to August 24, 1910.

(394) 5. **Mylothris rubricosta** (Mabille)

Pieris rubricosta MABILLE, 1890, Ann. Soc. Ent. France, (6) X, p. 28.
Mylothris rubricosta AURIVILLIUS, 1910, Seitz, Gross-Schmett., XIII, p. 35, Pl. XI*c*.

Six males and two females taken at Medje in June, July, and August. Thiss pecies is not very far removed from *M. bernice* (Hewitson), from which it differs in having the marginal border and spots of both wings smaller, and the female not suffused so broadly with fuscous upon the lighter areas of the fore and hind wings. I have a long series of *M. bernice* from the Ogové, from which this form differs in the respects noted, but I am not convinced that they are specifically distinct.

APPIAS Hübner

(395) 1. **Appias rhodope** (Fabricius)

Papilio rhodope FABRICIUS, 1775, Syst. Ent., p. 473.
Appias rhodope AURIVILLIUS, 1910, Seitz, Gross-Schmett., XIII, p. 37, Pl. XI*d*, ♂; XI*e*, ♀.

Seventeen males and four females. One male was taken at Batama in September 1909; one female at Risimu in September of the same year; one female at Niangara in November 1910; and the rest at Medje from June to August inclusive.

(396) 2. **Appias phaola** (Doubleday)

Pieris phaola DOUBLEDAY, 1847, Ann. Mag. Nat. Hist., (1) XX, p. 63.
Appias phaola AURIVILLIUS, 1910, Seitz, Gross-Schmett., XIII, p. 37, Pl. XI*c*, ♂; XI*d*, ♀.

A single male taken at Medje, August 20, 1910.

(397) 3. **Appias sabina** (Felder)

Pieris sabina Felder, 1865, Reise Novara, Lep., III, p. 165.
Appias sabina Aurivillius, 1910, Seitz, Gross-Schmett., XIII, p. 38, Pl. xi*f*, ♂; xi*e*, ♀.

The collection contains twenty-three males and two females. One male was taken at Kwamouth in July 1909. One female from Lubila, two males from Risimu, and another from Munie Katoto are, according to the labels, captures made in September 1909. One male was taken at Bafwasende in January, and four at Gamangui in February 1910. All the rest were caught at Medje at dates running through June, July, and August.

(398) 4. **Appias epaphia** (Cramer)

Papilio epaphia Cramer, 1779, Pap. Exot., III, p. 26, Pl. ccvii, figs. *D*, *E*.
Appias epaphia Aurivillius, 1910, Seitz, Gross-Schmett., XIII, p. 38, Pl. xi*f*, ♂.

One male taken at Kwamouth, July 15, 1909.

(399) 5. **Appias** sp. (?)

There is a single female taken at Gamangui, February 1, 1910, which agrees with that sex of *A. epaphia* with the exception that the base of the primaries and the limbal area of the secondaries lack the dark markings which are characteristic of this sex in that species. As the female of *A. epaphia* is somewhat variable, I hesitate to describe this even as a new variety, though it differs widely in appearance from anything the figures and descriptions of which are known to me. It evidently is a very near ally of the foregoing species. The apical markings on both sides of the fore wing are identical with those found in the females of that species, but the fact that the remaining areas of both the fore and hind wings are white, except for a little dark squamation near the base, makes the specimen contrast markedly with the long series of *A. epaphia* in my collection, with which I have compared it.

Pieris Godart

(400) 1. **Pieris creona** (Cramer)

Papilio creona Cramer, 1776, Pap. Exot., I, p. 148, Pl. xcv, figs. *C*, *F*.
Pieris creona Aurivillius, 1910, Seitz, Gross-Schmett., XIII, p. 40, Pl. xiii*b*.

Two males taken at Faradje in November, one female caught at Niangara in the same month, and a female captured at Medje, August 24, 1910, constitute the only representatives of this species in the collection.

(401) 2. **Pieris infida** Butler

Pieris infida BUTLER, 1888, Proc. Zool. Soc. London, p. 77. AURIVILLIUS, 1910, Seitz, Gross-Schmett., XIII, p. 41, Pl. XIII*b*.

There are two males and two females of this species in the collection. The males were taken at Faradje and the females at Niangara. One male bears the date "November 1910"; the rest of the specimens are simply marked "1911–1912."

(402) 3. **Pieris calypso** (Drury)

Papilio calypso DRURY, 1773, Ill. Exot. Ent., II, p. 30, Pl. XVII, figs. 3, 4, ♀.
Belenois (*Pieris*) *welwitschii* ROGENHOFER, 1889, Ann. K. K. Hofmuseums Wien, IV, p. 548, Pl. XXIII, fig. 2, ♀.
Pieris calypso AURIVILLIUS, 1910, Seitz, Gross-Schmett., XIII, p. 42, Pl. XIII*d*.

Of this common and well-known species there are forty-two males, two females of the typical form with white hind wings, and four females of the variety named *welwitschi* by Rogenhofer, in which the hind wings are orange. The specimens were mostly taken at Medje, a few at Gamangui, some at Niangara, and others at scattered localities. The dates of capture are those associated with these localities on all of the labels.

(403) 4. **Pieris theora** Doubleday

Pieris theora DOUBLEDAY, 1846, Ann. Mag. Nat. Hist., (1) XVII, p. 25. AURIVILLIUS, 1910, Seitz, Gross-Schmett., XIII, p. 43, Pl. XIII*e*.

Five males, one taken at Basoko in July 1909, one at Bafwasende in September of the same year, and three captured at Medje, one in each of the months, June, July, and September.

(404) 5. **Pieris theuszi** Dewitz

Pieris theuszi DEWITZ, 1889, Ent. Nachr., XV, p. 107, Pl. II, figs. 6–9. AURIVILLIUS, 1910, Seitz, Gross-Schmett., XIII, p. 44, Pl. XIV*a*.

Nine males and one female. The female, which is in not very good condition, was taken at Batama in September 1909; one male was caught at Bafwasende in the same month and year; a couple were taken at Niangara in November; and the remaining six were captured at Medje in June, July, and August.

(405) 6. **Pieris solilucis** Butler

Pieris solilucis BUTLER, 1874, Trans. Ent. Soc. London, p. 433. AURIVILLIUS, 1910, Seitz, Gross-Schmett., XIII, p. 44, Pl. XIV*a*.

All of the seventeen specimens are males. One was taken at Medje in August, the remaining sixteen were caught at Niangara in November.

Teracolus Swainson

(406) 1. **Teracolus evippe** (Linnæus)

Papilio evippe Linnæus, 1764, Mus. Lud. Ulr., p. 239.
Teracolus evippe Aurivillius, 1910, Seitz, Gross-Schmett., XIII, p. 57, Pl. xviii*e*.

I refer a specimen without abdomen and with badly tattered wings to this species. It was taken at Matadi, June 20, 1909. It is singular that this specimen should be the only representative of this great genus, which has its metropolis in Africa and which should be represented by a number of species in the eastern parts of the region visited by the expedition, the land of the "White Rhinoceros." It is absent from the densely wooded jungles of the great river-valleys, but appears in the grass-lands, wherever they occur south of the Sahara.

Terias Swainson

This genus, owing to the seasonal and local variations which occur in every species, presents many puzzling problems, some of which still await satisfactory solution. A multitude of so-called species, some of which are of doubtful validity, have been erected upon slight but apparently more or less constant differences. The test of breeding will alone serve to decide finally what is the exact relationship of some of the forms. The writer has had in his hands at various times, and still possesses, vast numbers of specimens representing the various forms occurring in Africa, but within certain limits has been hitherto unable to satisfy himself as to the proper classification of some of the varieties. The species appear to run into each other, and to be subject to great variation both in size, coloration, and markings. The following account of the specimens brought home by the American Museum Congo Expedition represents the results of very careful study and comparison with other specimens, many of which had been originally determined by direct comparison with the types in European collections, but nevertheless it leaves something to be desired, especially in the case of *T. senegalensis* and its varieties, which is extremely variable.

(407) 1. **Terias brenda** Doubleday and Hewitson

Terias brenda Doubleday and Hewitson, 1847, Gen. Diurn. Lep., II, p. 79, Pl. ix, fig. 6. Aurivillius, 1910, Seitz, Gross-Schmett., XIII, p. 64, Pl. xxii*c*.

Seventy-six males and two females, taken at almost every place where collections were made. The dates of capture represent every month in the year.

(408) 1*a*. **Terias brenda maculata** Aurivillius

Terias brenda var. *maculata* Aurivillius, 1910, Seitz, Gross-Schmett., XIII, p. 64, Pl. xxii*c*.

Two males taken at Gamangui in February, and an aberrant female caught at Bafwasende in January. This is the winter form of the species.

(409) 2. **Terias senegalensis** Boisduval

Terias senegalensis Boisduval, 1836, Spec. Gén. Lép., I, p. 672. Aurivillius, 1910, Seitz, Gross-Schmett., XIII, p. 64, Pl. xxii*c*.

The specimens which I refer to this species fall into two groups, one in which the marginal band of the primaries at the outer angle is broad and strongly produced on vein 2 as an inwardly projecting tooth, the other in which it is narrow and only slightly angulated on vein 2. Of the first group there are in the present collection twenty-two males, the majority taken at Faradje in November. One is labelled as from Munie Katoto, one from Kwamouth, one from Gamangui, and one from Basoko. The four last mentioned were taken in the months of June and July.

Of the second group there are twenty-six males and six females. Of these, thirteen males and two females were taken at Medje, one male and one female in January, one male in September, all the rest in June and July. Two males and a female are labelled as from Gamangui, taken in February, the remainder at Niangara and Faradje in November, so far as the labels indicate the date of capture.

(410) 2*a*. **Terias senegalensis bisinuata** (Butler)

Terias bisinuata Butler, 1876, Ann. Mag. Nat. Hist., (4) XVIII, p. 485. Aurivillius, 1910, Seitz, Gross-Schmett., XIII, p. 64, Pl. xxii*d*.

This, which is claimed to be the winter form of *T. senegalensis* and is characterized by heavy markings on the under side of the wings, is represented in the collection by fifteen males, twelve taken at Faradje in November, so far as the labels are dated, though many of the labels lack any indication of the month. One was captured at Niangara in the month named, one at Kwamouth on July 15, 1909, and one at Medje in August. Most of the specimens have the marginal band of the primaries broad at the outer angle and strongly toothed inwardly, but there are several in which it is narrow and only slightly angulated on vein 2, in this respect resembling the specimens in the second group referred to under the preceding form.

(411) 3. **Terias floricola ceres** (Butler)

Terias floricola Boisduval, 1833, Faune Ent. Madagr., p. 21.
Terias ceres Butler, 1875, Ann. Mag. Nat. Hist., (5) XVII, p. 218, Pl. v, fig. 3. Aurivillius, 1910, Seitz, Gross-Schmett., XIII, p. 64, Pl. xxii*d*.

There are two specimens, a male caught at Faradje, "1911–1912," and a female taken at Niangara in November.

(412) 4. **Terias hapale** Mabille

Terias hapale Mabille, 1882, Le Naturaliste, II, p. 99. Aurivillius, 1910, Seitz, Gross-Schmett., XIII, p. 65, Pl. xxii*d*.

Of this species there are four males and one female, all taken at Faradje. There is no clue to the month, the specimens being simply labelled "1911–1912."

(413) 5. **Terias desjardinsi** Boisduval

Terias desjardinsi Boisduval, 1833, Faune Ent. Madagr., p. 22, Pl. ii, fig. 6. Aurivillius, 1910, Seitz, Gross-Schmett., XIII, p. 65, Pl. xxii*e*.

Of this species there are four typical males, all taken at Niangara in November. There are nineteen other males taken at Niangara and Faradje, which are mostly smaller in size and with broader marginal bands, marking a transition in the direction of the following form, *T. regularis*, and intermediate between it and typical *desjardinsi*.

(414) 6. **Terias regularis** Butler

Terias regularis Butler, 1876, Ann. Mag. Nat. Hist., (4) XVIII, p. 486. Aurivillius, 1910, Seitz, Gross-Schmett., XIII, p. 65, Pl. xxii*e*.

This is regarded by Professor Aurivillius as an extreme summer form of the preceding, and is characterized by the great enlargement of the width of the marginal bands.

There are in the collection thirty-seven males and four females. Some, including all the females, were taken at Medje in June and July, some are labelled as taken at Niangara in November, one at Bafwabaka in January, another at Gamangui in February, and a number at Faradje, "1911–1912."

(415) 7. **Terias brigitta** (Cramer)

Papilio brigitta Cramer, 1780, Pap. Exot., IV, p. 82, Pl. ccci, figs. *B*, *C*.
Terias brigitta Aurivillius, 1910, Seitz, Gross-Schmett., XIII, p. 65, Pl. xxii*f*.

One damaged male taken at Matadi, June 24, 1909.

(416) 8. **Terias zoë** Hopffer

Terias zoë HOPFFER, 1855, Monatsber. Akad. Wiss. Berlin, p. 640. AURIVILLIUS, 1910, Seitz, Gross-Schmett., XIII, p. 65, Pl. XXII*f*.

One male taken at Niangara in November, and five males and two females caught at Faradje, "1911–1912."

ERONIA Boisduval

(417) 1. **Eronia pharis** (Boisduval)

Pieris pharis BOISDUVAL, 1836, Spec. Gén. Lép., I, p. 443.
Eronia pharis AURIVILLIUS, 1910, Seitz, Gross-Schmett., XIII, p. 62, Pl. XXI*c*.

Twelve males and six females, two of the former taken at Niangara in November, and one of the latter at Gamangui in June. All the other specimens were captured at Medje, the dates ranging from early in June to the end of August.

(418) 2. **Eronia thalassina** (Boisduval)

Pieris thalassina BOISDUVAL, 1836, Spec. Gén. Lép., I, p. 443.
Eronia thalassina AURIVILLIUS, 1910, Seitz, Gross-Schmett., XIII, p. 62, Pls. XV*c*, XXI*e*.

Twenty-five males, one of which was taken at Bafwasende in September, all the rest at Medje, a few in April, and the others from June to September.

(419) 3. **Eronia argia** (Fabricius)

Papilio argia FABRICIUS, 1775, Syst. Ent., p. 470.
Eronia argia AURIVILLIUS, 1910, Seitz, Gross-Schmett., XIII, p. 62, Pl. XI*c*, *d*.

Twenty-two males and one female, all taken at Medje, except one male caught at Boyulu in September 1909, and another at Niangara in November 1910. Of the specimens captured at Medje a few are dated as of April, the remainder as of June to September.

CATOPSILIA Hübner

(420) 1. **Catopsilia florella** (Fabricius)

Papilio florella FABRICIUS, 1775, Syst. Ent., p. 479.
Catopsilia florella AURIVILLIUS, 1910, Seitz, Gross-Schmett., XIII, p. 63.

Sixty-nine males and six females. Most of the specimens, including all of the females, were caught at Niangara in November. There are a few taken at Gamangui in February and at Stanleyville and Medje in July and August.

Papilioninæ

Papilio Linnæus

There are about sixty species and subspecies of this genus which are recorded from the African continent. Of these, twenty-three are represented in the collection upon which I am reporting.

(421) 1. **Papilio antimachus** Drury

Papilio antimachus Drury, 1782, Ill. Exot. Ent., III, p. 1, Pl. i. Aurivillius, 1908, Seitz, Gross-Schmett., XIII, p. 11, Pl. 1*a*.

One good and two somewhat damaged males. One is labelled as from Batama, taken in September 1909, another from Avakubi, May 1910, the third from Bafwasende, September 1910.

(422) 2. **Papilio zalmoxis** Hewitson

Papilio zalmoxis Hewitson, 1864, Exot. Butt., III, *Papilio*, Pl. vi, fig. 18. Aurivillius, 1908, Seitz, Gross-Schmett., XIII, p. 12, Pl. 1*b*.

There are five males, one caught at Avakubi, October 4, 1909, a second taken at Gamangui in February, two captured at Bafwasende in September, and the fifth caught at Niangara in November 1910.

(423) 3. **Papilio dardanus** Brown

Papilio dardanus Brown, 1776, New Ill. Zool., p. 52, Pl. xxii. Aurivillius, 1909, Seitz, Gross-Schmett., XIII, p. 13, Pl. 11*a*, ♂.

Papilio hippocoön Fabricius, 1793, Ent. Syst., III, part 1, p. 38, ♀. Hewitson, 1868, Exot. Butt., IV, *Papilio*, Pl. xii, fig. 38. Aurivillius, 1908, Seitz, Gross-Schmett., XIII, p. 13, Pl. 11*b*.

Twenty-eight males of this form, most of them taken at Medje, a few in April and a few in September, but most of them in July and August; one is labelled "Stanleyville, August 23, 1909," another "Munie Katoto, November 1909," and a third is marked as caught at "Niangara, November 1910."

One specimen of the female form *hippocoön* was taken at Niangara, November 17, 1910.

(424) 4. **Papilio cynorta** Fabricius

Papilio cynorta Fabricius, 1793, Ent. Syst., III, part 1, p. 37. Westwood, 1843, Arcana Ent., I, p. 15, Pl. xl, figs. 3, 4, ♂.

Papilio boisduvalianus Westwood, 1843, Arcana Ent., I, p. 151, Pl. xl, figs. 1, 2.

There are twelve males and two females. One greatly dwarfed male was caught at Niangara in November; all the rest are from Medje, two males taken in April, the rest in August and September.

(425) 5. **Papilio zenobia** Fabricius

Papilio zenobia Fabricius, 1775, Syst. Ent., p. 503. Aurivillius, 1908, Seitz, Gross-Schmett., XIII, p. 16, Pl. iii*b*.

Thirty-one specimens, including a couple of females. One male is somewhat aberrant, having the pale bands yellowish, not white as is usual. The specimens were mostly taken at Medje, a few in April, the rest from July to September inclusive, although several are ticketted as caught both at Medje and Niangara in November.

A number of the males have a small white spot at the end of the cell of the fore wing, as is always the case with the females, and therefore belong to the so-called "variety," to which Suffert has given the name *Papilio nobicea* (*Nomen vix conservandum*).

(426) 6. **Papilio mechowianus** Dewitz

Papilio cypræafila var. *mechowiana* Dewitz, 1885, Ent. Nachr., XI, p. 305, fig., ♂. Aurivillius, 1908, Seitz, Gross-Schmett., XIII, p. 16, Pl. iii*a*, ♀.

Papilio mechowianus Aurivillius, 1908, Seitz, Gross-Schmett., XIII, p. 16, Pl. iii*a*.

There are four specimens, one caught at Medje in July, the others at Niangara in November. They are all more or less defective, rubbed, and lacking antennæ.

(427) 7. **Papilio gallienus** Distant

Papilio gallienus Distant, 1879, Proc. Zool. Soc. London, p. 649.

There is a small army of specimens which I refer to this species, although the males have the transverse light bands of the wings on the upper side narrower than is shown in the figure given by Aurivillius (cf. Seitz, XIII, Pl. i). The females agree more nearly with the figure cited, and indeed this figure may represent the female. The author has unfortunately failed to indicate in the text or on the plate what sex his figure represents.

I count one hundred and twelve specimens of this species, mostly taken at Medje, or near by, at Gamangui, Bafwasende, and Bafwaboli. A few were caught in April, but the great majority were captured in July, August, and September.

(428) 8. **Papilio hesperus** Westwood

Papilio hesperus Westwood, 1843, Arcana Ent., I, p. 189, Pl. xlviii.

There are nine males taken at Medje from July to September.

(429) 9. **Papilio nireus** Linnæus

Papilio nireus Linnæus, 1758, Syst. Nat., 10th Ed., p. 464. Aurivillius, 1908, Seitz, Gross-Schmett., XIII, Pl. v*a*, v*b*.

This species is represented by sixty-six males, some of which by the reduction in width of the blue transverse band on the upper side of the wings approach in appearance the form *lycæus* Doubleday, which is prevalent in southern and eastern Africa.

A couple of the specimens are labelled as taken at Gamangui in February, a few as caught at Avakubi and Niangara in November, but by far the greater number were collected at Medje, some in April, the rest from June to September.

(430) 10. **Papilio bromius** Doubleday

Papilio bromius Doubleday, 1845, Ann. Mag. Nat. Hist., (1) XVI, p. 176. Aurivillius, 1908, Seitz, Gross-Schmett., XIII, Pl. v*b*, v*c*.

There are fifty-three males of this species in the collection. One was taken at Matadi, the rest at Medje, several in April, the rest in the mid-summer months.

(431) 11. **Papilio demodocus** Esper

Papilio demodocus Esper, 1798, Ausländische Schmett., p. 205, Pl. li, fig. 1.

This is the African race of *P. demoleus* Linnæus, which latter is common in the Asiatic tropics and also occurs in Arabia. It principally differs by being somewhat larger and darker and having the ocellus at the anal angle of the hind wing less conspicuously marked with red scales.

There are thirty-one males and six females. Twenty-seven of the specimens were taken at Niangara in the month of November, five at Medje in June and July, two at Stanleyville in August, one at Risimu in September, and one at Ngayu in December.

One of the males taken at Niangara on November 9, 1910. is remarkable because all the light spots on the upper side of the wings are brilliant lemon-yellow, and not creamy white, as is usually the case. One female belongs to the varietal form to which Capronnier gave the name *nubila* (cf. Aurivillius, Seitz, *loc. cit.*, Pl. iv*a*) in which the light spots on the upper side of the wings are ochreous. Aurivillius suggests that this so-called subspecies is based upon discolored ("verfärbte") specimens. I find it, however, difficult to agree with him, inasmuch as I have before me as I write, quite a long series of such specimens, coming from many different localities from all over the continent, and all in such state of preservation as to militate against the idea that the color is other than natural. In every larger series of this species which has come into my hands I have found a few specimens which have the pale markings ochreous and, therefore, belong to the form *nubila*. Though merely a color-variety, it occurs constantly, and I should say that it is no exaggeration to affirm that at least two per cent of the specimens collected belong to it.

(432) 12. **Papilio menestheus lormieri** Distant

Papilio menestheus Drury, 1773, Ill. Exot. Ent., II, p. 15, Pl. ix, figs. 1, 2.

Papilio menestheus var. *lormieri* Distant, 1874, Ent. Mo. Mag., XI, p. 129. Aurivillius, 1908, Seitz, Gross-Schmett., XIII, p. 20, Pl. viii*b*.

All of the specimens in the collection belong to the varietal form described by Distant, which differs from typical *P. menestheus* in having the transverse band of pale spots on the fore wing nearly straight, and not curving inwardly near the costa in the direction of the base of the wing. The typical form occurs in Sierra Leone and the northern parts of the range of the insect, but the variety *lormieri* is most prevalent from southern Cameroon and the valley of the Ogové eastward into the hot wooded interior of the continent and reaches as far south as Mashonaland.

There are seventy-five specimens of this insect in the collection, including a couple of females. Most of them were taken at Medje, a few in April, the rest from June to September, but chiefly in the months of July and August, A small number are labelled as having been taken at Niangara in November.

(433) 13. **Papilio ridleyanus** White

Plate VI, Figure 3, typical ♂

Papilio ridleyanus White, 1843, Ann. Mag. Nat. Hist., (1) XII, p. 262, fig. Aurivillius, 1908, Seitz, Gross-Schmett., XIII, p. 21, Pl. 1*a*.

Twenty-three male specimens. Of these nine are labelled as having been taken at Gamangui in February, six at Medje in June and July, three at Bafwasende in September, four at Niangara in November, and one "near Barumbu, July 31, 1909."

(434) 13*a*. **Papilio ridleyanus fumosus,** new variety

Plate VI, Figure 4, ♀

P. ridleyanus is dimorphic. Two males from Medje and two from Bafwasende belong to a variety in which the red color of both wings disappears and is replaced by dull smoky gray. This is true also of a certain proportion of the females of the species. I have before me as I write a number of females taken by Antisdel in the Belgian Congo not far from Leopoldville, some of which are colored like the typical males and are marked with bright red spots, but one of which is precisely like the smoky-winged males from Medje and Bafwasende. For this form I propose the subspecific name given above.

Type ♂ from Bafwasende in The American Museum of Natural History; allotype ♀ in Carnegie Museum (Coll. Antisdel). Paratypes in The American Museum of Natural History and Holland Collection in the Carnegie Museum.

(435) 14. **Papilio pylades** Fabricius

Papilio pylades FABRICIUS, 1793, Ent. Syst., III, part 1, p. 34. AURIVILLIUS, 1908, Seitz, Gross-Schmett., XIII, p. 21, Pl. VIIc.

There are seventy-eight specimens, almost all of which are males. They were mostly taken at Niangara in Hovember. Six are labelled as from Faradje, one of which bears date as of November, and the rest are without designation of day or month. Only one specimen is recorded as from Medje, and is dated August 1, 1910.

There is not much to be remarked about the specimens, except that they run very small in size, which suggests that they represent the wet-season form.

(436) 15. **Papilio angolanus** Gœze

Papilio angolanus GŒZE, 1779, Ent. Beitr., III, part 1, p. 87. AURIVILLIUS, 1908, Seitz, Gross-Schmett., XIII, p. 21, Pl. VII*b*.

A solitary male, taken at Matadi, June 1909, represents this species.

(437) 16. **Papilio tyndaræus** Fabricius

Papilio tyndaræus FABRICIUS, 1793, Ent. Syst., III, part 1, p. 35. AURIVILLIUS, 1908, Seitz, Gross-Schmett., XIII, p. 22, Pl. VII*a*.

There are nine males, one of which is discolored. One was taken at Bafwabaka, January 7; two at Gamangui in February; five at Medje, two of these in April, the other three one each in June, August, and September; one was captured at Niangara in November.

(438) 17. **Papilio theorini** Aurivillius

Papilio theorini AURIVILLIUS, 1881, Ent. Tidskr., II, p. 45; 1908, Seitz, Gross-Schmett., XIII, p. 21, Pl. III*d*.

Represented by four males captured at Medje, two in April, one in July, and one in August 1910.

(439) 18. **Papilio ucalegonides** Staudinger

Papilio ucalegonides STAUDINGER, 1884, Exot. Schmett., I, p. 10, Pl. V (as *P. ucalegon*).
Papilio ucalegonides AURIVILLIUS, 1908, Seitz, Gross-Schmett., XIII, p. 23.

Two males taken at Medje in September.

(440) 19. **Papilio charcedonius** Karsch

Papilio charcedonius Karsch, 1895, Ent. Nachr., XXI, p. 285. Aurivillius, 1908, Seitz, Gross-Schmett., XIII, p. 24, Pl. ix*c*.

Two males, one caught at Medje in August, the other at Niangara in November.

(441) 20. **Papilio leonidas** Fabricius

Papilio leonidas Fabricius, 1793, Ent. Syst., III, part 1, p. 35. Aurivillius, 1908, Seitz, Gross-Schmett., XIII, p. 22, Pl. vii*d*.

Eleven specimens caught at Medje, two in April, the rest from July to September; nine captured at Niangara in November; one at Risimu, September 8, 1909; one at Avakubi in November; and two at Faradje in December.

(442) 21. **Papilio antheus** Cramer

Papilio antheus Cramer, 1779, Pap. Exot., III, p. 72, Pl. ccxxxiv, figs. *B*, *C*. Aurivillius, 1908, Seitz, Gross-Schmett., XIII, p. 25, Pl. ix*a*.

There are thirty-seven specimens, one caught at Medje in April, two taken at the same place in July, and all the rest captured at Gamangui in February.

(443) 22. **Papilio policenes** Cramer

Papilio policenes Cramer, 1775, Pap. Exot., I, p. 61, Pl. xxxvii, figs. *A*, *B*. Aurivillius, 1908, Seitz, Gross-Schmett., XIII, p. 25.

There are one hundred and six examples of this common species in the collection. Most of them were taken at Gamangui in February, but a score or more are labelled as from Medje, a few taken in April, the rest in the mid-summer months. A few were caught at Niangara in November, and one is labelled "Ngayu, December."

(444) 23. **Papilio illyris** Hewitson

Papilio illyris Hewitson, 1873, Ent. Mo. Mag., IX, p. 232. Aurivillius, 1908, Seitz, Gross-Schmett., XIII, p. 26, Pl. viii*a*.

A single male taken at Medje in the first week of September.

Hesperiidæ

In view of the large number of species, nearly three hundred, belonging to the family Hesperiidæ, which are already known to occur in the region of the Congo, the collection brought home by the Lang-Chapin Expedition is somewhat disappointing. Like the collection of the Lycænidæ reported upon on preceding pages, it shows that the native collectors who were employed to gather insects concentrated their attention upon the larger and showier species in other families. In comparison with the really splendid collection of Nymphalidæ, the Hesperiidæ make a rather poor showing. Nevertheless, some excellent things turn up, as for instance a specimen of *Procampta rara* Holland, hitherto only known by the type, which until now was unique, and two new species, *Abantis rubra* and *Leptalina niangarensis*. The collection contains ninety-four specimens of the Hesperiidæ, representing thirty-seven species, belonging to twenty-three genera. Many species are represented by but one specimen.

Hesperiinæ

SARANGESA Moore

Subgenus HYDA Mabille

(445) 1. **Sarangesa (Hyda) grisea** (Hewitson)

Pterygospidea grisea Hewitson, 1878, Ann. Mag. Nat. Hist., (5) I, p. 344.

Hyda micacea Mabille, 1889, Ann. Soc. Ent. France, (6) IX, Bull., p. clxviii. Mabille and Vuillot, 1893, Novit. Lep., p. 93, Pl. xiii, fig. 3.

Hyda grisea Holland, 1896, Proc. Zool. Soc. London, p. 6. Mabille, 1904, Gen. Ins., XVII, p. 55.

The species is represented by a single male specimen captured at Medje, July 19, 1910.

Subgenus SAPE Mabille

(446) 2. **Sarangesa (Sape) maculata** (Mabille)

Sape maculata Mabille, 1891, C. R. Soc. Ent. Belgique, p. lxviii. Holland, 1896, Proc. Zool. Soc. London, p. 10. Mabille, 1904, Gen. Ins., XVII, p. 55.

There are two somewhat worn male specimens from Niangara which agree so closely with a series of finely preserved examples collected for me at Mombasa by Doherty and which are undoubtedly referable to *S. maculata* Mabille, that I do not hesitate to place them here. In 1896 at the time I prepared my 'Synonymic Catalogue of the Hesperiidæ of Africa' I only knew *S. maculata* by the description published by Mabille. The species is well defined and thoroughly valid, as shown by the material before me.

CELÆNORRHINUS Hübner

(447) 1. **Celænorrhinus galenus** (Fabricius)

Hesperia galenus Fabricius, 1793, Ent. Syst., III, part 1, p. 350.

Hesperia galena Donovan, 1800, Ins. India, Pl. i, fig. 3, ♀.

Plesioneura galenus Staudinger, 1888, Exot. Schmett., part 1, p. 300; part 2, Abbild., Pl. c, ♂.

Celænorrhinus galenus HOLLAND, 1896, Proc. Zool. Soc. London, p. 12. MABILLE, 1904, Gen. Ins., XVII, p. 51.

The species is represented in the collection by four males and two females, all of which were taken at Medje, the dates of capture ranging from April to August 1910.

(448) 2. **Celænorrhinus rutilans** (Mabille)

Pardaleodes rutilans MABILLE, 1877, Bull. Soc. Zool. France, p. 235, ♀. MABILLE AND VUILLOT, 1893, Novit. Lep., p. 96, Pl. XIII, fig. 7, ♂.

Pterygospidea tergemira HEWITSON, 1877, Ann. Mag. Nat. Hist., (4) XX, p. 323.

Tagiades wœrmanni PLŒTZ, 1879, Stett. Ent. Zeit., XL, p. 362, ♀.

Celænorrhinus rutilans HOLLAND, 1896, Proc. Zool. Soc. London, p. 12. MABILLE, 1904, Gen. Ins., XVII, p. 51.

Four males and one female of this species were taken at Medje in the months of July and August 1910.

(449) 3. **Celænorrhinus boadicea** (Hewitson)

Pterygospidea boadicea HEWITSON, 1877, Ann. Mag. Nat. Hist., (4) XX, p. 323.

Celænorrhinus atratus HOLLAND, (part), 1894, Ent. News, Pl. III, fig. 5.

Celænorrhinus boadicea HOLLAND, 1896, Proc. Zool. Soc. London, p. 14, Pl. III, fig. 1. MABILLE, 1904, Gen. Ins., XVII, p. 51.

One male specimen was caught at Medje in August 1910.

(450) 3. **Celænorrhinus chrysoglossus** (Mabille)

Ancistrocampta chrysoglossa MABILLE, 1891, C. R. Soc. Ent. Belgique, XXXV, p. cvii.

Celænorrhinus chrysoglossa HOLLAND, 1896, Proc. Zool. Soc. London, p. 14, Pl. III, fig. 5. MABILLE, 1904, Gen. Ins., XVII, p. 51.

There is a male in somewhat damaged condition caught at Medje, April 6, 1910.

TAGIADES Hübner

(451) 1. **Tagiades flesus** (Fabricius)

Papilio flesus FABRICIUS, 1771, Spec. Ins., II, p. 135, No. 621.

Papilio ophion DRURY, 1782, Ill. Exot. Ent., III, Pl. XVII, figs. 1, 2.

Nisoniades flesus BUTLER, 1869, Cat. Fabr. Diurn. Lep., p. 286.

Nisoniades ophion TRIMEN, 1866, Rhop. Afr. Austr., II, p. 313.

Tagiades flesus WATSON, 1893, Proc. Zool. Soc. London, p. 54. HOLLAND, 1896, Proc. Zool. Soc. London, p. 16. MABILLE, 1904, Gen. Ins., XVII, p. 53.

There are two males and four females of this well-known and widely distributed species; the males taken at Niangara in November; two females at Medje, one in July, the other in August; a third female at Niangara in November 1910; and a fourth at Stanleyville, in March 1915.

Eagris Guenée

(452) 1. **Eagris lucetia** (Hewitson)

Leucochitonea lucetia Hewitson, 1875, Ill. Exot. Butt., V, July, *Leucochitonea*, Pl. ii, fig. 21.

Eagris lucetia Holland, 1896, Proc. Zool. Soc. London, p. 19. Mabille, 1904, Gen. Ins., XVII, p. 54.

There are four males of this well-defined species, all taken at Medje, one in April, two in June, and one in August 1910. Hewitson originally described the insect from Angola.

Procampta[1] Holland

(453) 1. **Procampta rara** Holland

Procampta rara Holland, 1892, Ann. Mag. Nat. Hist., (6) X, p. 293. Watson, 1893, Proc. Zool. Soc. London, p. 59. Holland, 1894, Ent. News, Pl. iii, fig. 7; 1896, Proc. Zool. Soc. London, p. 19.

There is a single specimen of this scarce insect, which is labelled as taken at Medje, August 24, 1910. It has been compared with the type, and agrees with it in every particular. So far as I know, it is the second specimen which has thus far turned up. The type came from the valley of the Ogové River. The butterfly seems to have been overlooked by collectors, probably because of its small size and obscure coloration.

Caprona Wallengren

(454) 1. **Caprona pillaana** Wallengren

Caprona pillaana Wallengren, 1857, Kongl. Sv. Vet.-Akad. Handl., N. S., II, No. 4, p. 51.

Stethotrix heterogyna Mabille, 1889, Ann. Soc. Ent. France, (6) IX, Bull., p. clxxxiv.

Caprona adelica Karsch, 1892, Ent. Nachr., XVIII, p. 242; 1893, Berl. Ent. Zeit., XXXVIII, p. 243, Pl. vi, fig. 2.

Caprona pillaana Holland, 1896, Proc. Zool. Soc. London, p. 19. Mabille, 1904, Gen. Ins., XVII, p. 76.

There is one ragged male specimen of this species which, according to the label, was taken at "Faradje 1911–1912."

---

[1] Mabille in the 'Genera Insectorum,' Fasc. XVII, in the Index gives the genus *Procampta* Holland and refers to "p. 59"; he also cites in the Index the specific name *rara* "sp. gen. *Procampta*," and refers to p. 131. Neither of these pages contains the slightest allusion either to the genus or the species. On page 13, in one of the keys to the genera he cites *Procampta* as belonging to Section II. I am curious to know how the Index of the work was fabricated, so as to cite the genus and species and the pages on which they are recorded, without their being there at all. I may say in passing that while I have the warmest personal regard for the author of this work, which must be constantly referred to, it so abounds in typographical errors and omissions as to make its use exceedingly trying. It is the "despair" of working hesperidologists. So far as the Hesperiidæ of temperate and boreal North America are concerned, it completely ignores everything of importance which had been done by students in the United States and Canada during the quarter of a century which had elapsed prior to its appearance.

ABANTIS[1] Hopffer

(455) 1. **Abantis elegantula** (Mabille)

Sapæa elegantula MABILLE, 1890, Ann. Soc. Ent. France, (6) X, p. 32. MABILLE AND VUILLOT, 1891, Novit. Lep., p. 23, Pl. III, fig. 6.

This species is represented by a solitary male taken at Medje, March 8, 1910.

(456) 2. **Abantis efulensis** Holland

Abantis efulensis HOLLAND, 1896, Proc. Zool. Soc. London, p. 21, Pl. v, fig. 12.

There is a single male specimen from Medje which differs from the type, with which it has been compared, only in the fact that the outer border of the hind wings on the upper side is clouded with dark scales to a greater extent than is the case in the individual which I originally described and figured. In this respect, however, it does not differ from other individuals collected since my first description was published.

(547) 3. **Abantis rubra,** new species

Plate XII, Figure 1, ♂

♂. Frons and inner margins of palpi reddish orange; outer margins of palpi deep black with a white spot at the base of each just below the eye. Thorax and patagia dark brown, the patagia, so far as the specimen reveals, without light markings (the patagia are in bad case). Abdomen dark brown, with a black median longitudinal line above, and the edges of the segments on the sides adorned with pale reddish vertical spots; lower side of abdomen paler brown than above. The primaries on the upper side are pale semitranslucent fuscous, with all the veins dark brown and clearly defined against the paler ground-color. There is a small subcircular blackish spot at the base, defined outwardly by a few orange-red scales. The ground-color of the secondaries on the upper side is orange-red, the veins are black and clearly defined against the ground-color. At the end of the cell about the middle of the wing is a sharply defined velvety black spot, from which through the middle of the cell there runs to the base a narrow black ray of the same color as the spot at the end of the cell. The outer margin of the secondaries on the upper side is bordered by fuscous, defined inwardly by a narrow band of darker brown which widens a little towards the anal angle. The inner margin is shaded with fuscous. On the under side both wings are pale reddish inclining to fuscous, with all the markings of the upper side reproduced, but in paler tints than on the upper side. Expanse, 33 mm.

---

[1] Fairmaire in the Annals of the Entomological Society of Belgium, XXXVIII, 1894, p. 395, announces that he has been informed by his learned colleague, Dr. Berg, that the generic name *Abantis* Hopffer should be replaced by the generic name *Abantiades* Herrich-Schæffer, and states that he hastens to make announcement of the fact. Unfortunately for this supposed correction I discover that the generic name *Abantiades* was proposed by Herrich-Schæffer for one of the large Australian Hepialids, and he makes *Epiolus* (*Pielus* Walker) *argenteus* Donovan the type of the genus. As the Hepialidæ and the Hesperiidæ are rather far apart in any system of classification, which has thus far been proposed (about as far apart as tigers and squirrels among mammals), the correction provokes a smile. The name *Abantis* Hopffer stands in spite of the discovery of Doctors Berg and Fairmaire. The type of the genus is *A. tettensis* Hopffer, as pointed out by Scudder (Proc. Amer. Acad. Arts and Sciences, X, 1875, p. 99).

The type, which is in The American Museum of Natural History, is unique. It was taken at Medje, April 6, 1910.

The genus *Abantis* is thus far known to include eighteen species, all of which are found in the Æthiopian subregion. They are the following:

1. *Abantis tettensis* HOPFFER, 1855, Monatsber. Akad. Wiss. Berlin, p. 643; 1862, Peters, Reise n. Mossambique, Ins., p. 415, Pl. xxvi, figs. 16, 17.
    Eastern tropical Africa.
2. *Abantis paradisea* (BUTLER), 1870, Trans. Ent. Soc. London, p. 499; 1874, Lep. Exot., p. 167, Pl. LIX, fig. 8.
    Abantis namaquaana (WESTWOOD), 1874, Thes. Ent. Oxon., p. 183, Pl. xxxiv, fig. 10, ♀.
    Southern Africa.
3. *Abantis zambesiaca* (WESTWOOD), 1874, Thes. Ent. Oxon., p. 183, Pl. xxxiv, fig. 9.
    Abantis zambezina TRIMEN, 1889, S. Afr. Butt., III, p. 344.
    Abantis trimeni (BUTLER), 1895, Proc. Zool. Soc. London, p. 264, Pl. xv, fig. 5.
    Southern tropical Africa.
4. *Abantis bismarcki* KARSCH, 1892, Ent. Nachr., XVIII, p. 228; 1893, Berl. Ent. Zeit., XXXVIII, p. 242, Pl. vi, fig. 1.
    Togoland.
5. *Abantis bicolor* (TRIMEN), 1864, Trans. Ent. Soc. London, (3) II, p. 180; 1866, Rhop. Afr. Austr., II, p. 307, Pl. vi, fig. 1.
    South Africa.
6. *Abantis venosa* TRIMEN, 1889, S. Afr. Butt., III, p. 339; 1891, Proc. Zool. Soc. London, p. 105, Pl. ix, fig. 24.
    Abantis umvulensis (E. Sharpe), 1890, Ann. Mag. Nat. Hist., (6) VI, p. 348.
    Southern tropical Africa, Transvaal.
7. *Abantis elegantula* (MABILLE), 1890, Ann. Soc. Ent. France, (6) X, p. 32. MABILLE AND VUILLOT, 1891, Novit. Lep., p. 24, Pl. III, fig. 6.
    Sierra Leone, Cameroon, Belgian Congo.
8. *Abantis efulensis* HOLLAND, 1896, Proc. Zool. Soc. London, p. 21, Pl. v, fig. 12.
    Cameroon, Belgian Congo.
9. *Abantis plerotica* KARSCH, 1896, Ent. Nachr., XXII, p. 374.
    German East Africa.
10. *Abantis leucogaster* (MABILLE), 1890, Ann. Soc. Ent. France, (6) X, p. 32. MABILLE AND VUILLOT, 1891, Novit. Lep., p. 22, Pl. III, fig. 5.
    Sierra Leone.
11. *Abantis nigeriana* BUTLER, 1901, Ann. Mag. Nat. Hist., (6) VIII, p. 59.
    Nigeria.
12. *Abantis arctomarginata* LATHY, 1901, Trans. Ent. Soc. London, p. 34, Pl. III. fig. 7.
    Zomba, British Central Africa.
13. *Abantis ja* H. H. DRUCE, 1909, Proc. Zool. Soc. London, p. 408, Pl. LXVII, fig. 2.
    Interior of Cameroon.

14. *Abantis lucretia* H. H. DRUCE, 1909, Proc. Zool. Soc. London, p. 409, Pl. LXVII, fig. 3.
    Interior of Cameroon.
15. *Abantis lofu* NEAVE, 1910, Proc. Zool. Soc. London, p. 72, Pl. III, figs. 4, 5.
    Northern Rhodesia.
16. *Abantis levubu* (WALLENGREN), 1857, Kongl. Sv. Vet.-Akad. Handl., N. S., II, No. 4, p. 72.
17. *Abantis amneris* REBEL AND ROGENHOFER, 1894, in O. Baumann's 'Durch Masailand zur Nilquelle,' p. 338.
    Umbugwe.
18. *Abantis rubra* HOLLAND, new species.
    Belgian Congo.

HESPERIA Fabricius

(458) 1. **Hesperia dromus** (Plœtz)

Pyrgus dromus PLŒTZ, 1884, Mitth. nat. Ver. Neu-Vorpomm. u. Rüg., p. 6. TRIMEN, 1889, S. Afr. Butt., III, p. 283.

Hesperia dromus WATSON, 1893, Proc. Zool. Soc. London, p. 65. HOLLAND, 1896, Proc. Zool. Soc. London, p. 23. MABILLE, 1904, Gen. Ins., XVII, p. 81.

Five specimens, three males and two females, were collected. Two were captured at Medje in the first week of April; one was taken at Faradje, December 5, 1912; the other two specimens were captured at Niangara in the second week of November 1910.

(459) 2. **Hesperia plœtzi** Aurivillius

Syrichtus spio PLŒTZ, 1884, Mitth. nat. Ver. Neu-Vorpomm. u. Rüg., p. 21.

Pyrgus spio MABILLE, 1890, Ann. Soc. Ent. France, (6) X, p. 30.

Hesperia plœtzi AURIVILLIUS, 1891, Ent. Tidskr., p. 227. KARSCH, 1893, Berl. Ent. Zeit., XXVIII, p. 245. HOLLAND, 1896, Proc. Zool. Soc. London, p. 23. MABILLE, 1904, Gen. Ins., XVII, p. 81.

There are two specimens in the collection, one taken at Gamangui, February 5, the other at Medje, April 6, 1910.

Pamphilinæ

ACLEROS Mabille

(460) 1. **Acleros plœtzi** Mabille

Apaustus leucopygus PLŒTZ, 1879, Stett. Ent. Zeit., XL, p. 360.

Acleros plœtzi MABILLE, 1889, Ann. Soc. Ent. France, (6) IX, Bull., p. clxxiii. HOLLAND, 1896, Proc. Zool. Soc. London, p. 29, Pl. II, fig. 7. MABILLE, 1904, Gen. Ins., XVII, p. 96.

This rather common species is represented in the collection by one tattered male taken at Medje, June 26, 1910.

Osmodes Watson

(461) 1. **Osmodes laronia** (Hewitson)

Hesperia laronia Hewitson, 1868, Descript. Hesper., p. 35.

Plastingia laronia Plœtz, 1879, Stett. Ent. Zeit., XL, p. 356; 1884, idem, XLV, pp. 145–146.

Osmodes laronia Watson, 1893, Proc. Zool. Soc. London, p. 78. Holland, 1896, Proc. Zool. Soc. London, p. 40, Pl. iv, figs. 3, 5. Mabille, 1904, Gen. Ins., XVII, p. 102.

Represented by a male and female captured at Medje in August 1910.

Hypoleucis Mabille

(462) 1. **Hypoleucis cretacea** (Snellen) (?)

Goniloba cretacea Snellen, 1872, Tijd. v. Ent., p. 27, Pl. ii, figs. 4–6.

Hesperia gonessa Hewitson, 1877, Ann. Mag. Nat. Hist., (4) XIX, p. 76. Heron, 1898, Ann. Mag. Nat. Hist., (7) I, p. 256.

Hypoleucis cretacea Holland, 1896, Proc. Zool. Soc. London, p. 47 (where further synonymy is given).

There is a single somewhat damaged female which I refer with caution to this species, from typical examples of which it apparently differs only by a reduction in size of the translucent white spots of the primaries. The specimen was captured at Medje, July 17, 1910.

Leptalina Mabille

M. P. Mabille, in his Revision of the Family Hesperiidæ in the 'Genera Insectorum,' published by P. Wytsman, has erected the genus *Leptalina* for the reception of *Cyclopides unicolor* Bremer and Gray, which is found in China and Japan, and the three African species, *lepeletieri* (Latreille), *tsita* (Trimen), and *inornatus* (Trimen), which hitherto have been commonly regarded as belonging to the genus *Cyclopides*. I am quite familiar with the Asiatic species, having personally collected it in quantity when engaged in research work in Japan in 1887. I am somewhat dubious as to the propriety of removing it from the genus *Cyclopides*. There seems to me to be more propriety in separating the three African forms from their former association. I propose to add to the genus *Leptalina* Mabille another species the description of which is given herewith.

(463) 1. **Leptalina niangarensis,** new species

Plate XII, Figure 3, ♂

♂. Palpi dark fuscous, upper side of thorax and abdomen blackish, lighter on the under side, inclining to ochraceous, the terminal segments on their posterior edges marked laterally with pale scales. Both fore and hind wings on the upper side uniformly dark brown, without any traces of translucent spots or other maculation. Cilia concolorous. On the under side both wings are colored as on the upper side, but are slightly paler in their ground-color, and near the base are clothed with ochraceous scales. The hind wings on this side reveal a dark subcircular and somewhat diffuse spot in the cell at its extremity and this is followed externally by a postmedian dark band, which corresponds in its curvature to the outer margin. Expanse, 32 mm.

Two specimens were taken by the Lang-Chapin Expedition at Niangara in November 1910. One of these, which I designate as the type, is in The American Museum of Natural History; the other, which I designate as the paratype, I have the pleasure of retaining for the Holland Collection in the Carnegie Museum.

I append a brief key for the determination of the four species of the genus *Leptalina* now known to occur in Africa.

A. Hind wings marked on the under side by light longitudinal lines.
  1. Hind wings marked by two conspicuous silvery white lines, running through the cell from the base to the outer margin, the upper line broader and most conspicuous.......................... *lepeletieri* (Latreille).
  2. Hind wings having the nervules, especially in the outer half of the wing covered with white scales, causing the veins to stand out clearly against the darker ground-color.......................... *tsita* (Trimen).

B. Hind wings not marked on the under side by light lines, running from the base toward the outer margin.
  1. Fore wings with three minute translucent subapical spots..*inornatus* (Trimen).
  2. Fore wings without translucent spots; hind wings on the under side with an obscure dark subcircular spot at the end of the cell, followed by a cloudy dark postmedian transverse band .... *niangarensis* Holland.

CHAPRA Moore

(464) 1. **Chapra mathias** (Fabricius)

Hesperia mathias FABRICIUS, 1798, Ent. Syst., Suppl., p. 436.
(For synonymy cf. Holland, 1896, Proc. Zool. Soc. London, p. 60.)

One male caught at Boma, June 15, 1915.

PARNARA Moore

(465) 1. **Parnara borbonica** (Boisduval)

Hesperia borbonica BOISDUVAL, 1833, Faune Ent. Madgr., p. 65, Pl. IX, figs. 5, 6.
(For additional synonymy cf. Holland, 1896, Proc. Zool. Soc. London, p. 62.)

There are two specimens of this common insect in the collection, one taken at Faradje, December 6, 1912, and another at the same place, labelled "1911–1912."

(466) 2. **Parnara alberti** (Holland)

Baoris alberti Holland, 1896, Proc. Zool. Soc. London, p. 67, Pl. ii, fig. 21.
Parnara alberti Mabille, 1904, Gen. Ins., XVII, p. 136.

Of this species there are three specimens, one taken at Medje, June 27, 1910; one at Matadi, August 24, 1910; and one at Faradje, labelled "1911–1912." They all agree with specimens taken on the Ogové River and in southern Cameroon.

M. Mabille has transferred this species and several others which I classified under *Baoris* Moore to the genus *Parnara* Moore. The distinction between the two genera, as is pointed out by Mabille, is rather fine, based principally upon the length of the antennæ and the sexual brands, which do not always afford good grounds for generic separation. I follow Mabille provisionally, though feeling that the whole group needs a more careful revision than it has thus far received and that a systematic examination of the vast number of species now lumped under the name *Parnara* will disclose that the group, as made up, contains a good many incongruous elements.

SEMALEA[1] Holland

(467) 1. **Semalea pulvina** (Plœtz)

Hesperia pulvina Plœtz, 1879, Stett. Ent. Zeit., XL, p. 353.
Cobalus carbo Mabille, 1889, Ann. Soc. Ent. France, (6) IX, Bull., p. clxix.
Trichosemeia pulvina Watson, 1893, Proc. Zool. Soc. London, p. 53.
Semalea pulvina Holland, 1896, Proc. Zool. Soc. London, p. 65, fig. and Pl. ii, fig. 14. Mabille, 1904, Gen. Ins., XVII, p. 138.

One male specimen caught at Medje, August 24, 1910.

PLATYLESCHES Holland

(468) 1. **Platylesches batangæ** Holland

Parnara batangæ Holland, 1894, Ent. News, V, p. 92, Pl. iii, fig. 10.
Platylesches batangæ Holland, 1896, Proc. Zool. Soc. London, p. 73. Mabille, 1904, Gen. Ins., XVII, p. 138.

There is one dwarfed and also somewhat damaged specimen of this species which I have carefully compared with the type and find to be identical. It is ticketted as taken at "Basoko, July 3, 1909."

---

[1] The genus *Semalea* Holland is omitted from the Index in Mabille's work, *loc. cit.*, but occurs on p. 138, with notes and comments thereon by M. Mabille.

PARDALEODES Butler

(469) 1. **Pardaleodes edipus** (Cramer)

Papilio edipus CRAMER, 1782, Pap. Exot., IV, p. 146, Pl. CCCLXVI, figs. *E*, *F*, ♂.
Pamphila (?) *sator* DOUBLEDAY AND HEWITSON, 1852, Gen. Diurn. Lep., II, p. 523, Pl. LXXIX, fig. 4, ♀.
(For further synonymy cf. Holland, 1896, Proc. Zool. Soc. London, p. 75.)

There are three males and one female referable to this species. All of them were taken at Medje in the months of July and August 1910.

(470) 2. **Pardaleodes incerta** (Snellen)

Pamphila incerta SNELLEN, 1872, Tijd. v. Ent., p. 29, Pl. X, figs. 10–12, ♂.
Hesperia coanza PLŒTZ, 1883, Stett. Ent. Zeit., XLIV, p. 232, ♀.
Pardaleodes incerta HOLLAND, 1896, Proc. Zool. Soc. London, p. 75.

Four males; three taken at Medje, two in July, the other in August; the fourth specimen caught at Niangara, November 26, 1910.

(471) 3. **Pardaleodes bule** Holland

Pardaleodes bule HOLLAND, 1896, Proc. Zool. Soc. London, p. 76, Pl. III, fig. 21.

Two specimens from Medje, one collected in April, the other in August 1910.

(472) 4. **Pardaleodes fan** (Holland)

Osmodes (?) *fan* HOLLAND, 1894, Ent. News, V, p. 91, Pl. III, fig. 8.
Pardaleodes fan HOLLAND, 1896, Proc. Zool. Soc. London, p. 79.

Two specimens caught at Medje, August 1910.

CERATRICHIA Butler

(473) 1. **Ceratrichia ialemia** H. H. Druce

Ceratrichia ialemia H. H. DRUCE, 1909, Proc. Zool. Soc. London, p. 413, Pl. LXVII, fig. 10.

One male taken at Medje, August 13, 1910, which agrees closely with the description and figure given by Druce. The species is very near to *C. nothus* (Fabricius) and is probably only a form of that.

(474) 2. **Ceratrichia phocion** (Fabricius)

Papilio phocion FABRICIUS, 1781, Spec. Ins., II, p. 138.
Ceratrichia phocion BUTLER, 1870, Cat. Fabr. Diurn. Lep., p. 274, Pl. III, fig. 14. HOLLAND, 1896, Proc. Zool. Soc. London, p. 79.
Apaustus argyrosticta PLŒTZ, 1879, Stett. Ent. Zeit., XL, p. 358, ♀.

Four males and one female of this common insect, all taken at Medje from July to September 1910. The females are variable in the number and size of the small light markings on the wings, as are also the males to a less extent. There are before me as I write several hundreds of specimens of the species, representing both sexes, some pairs taken *in copula*, and a quite considerable series of females from the Ogové and southern Cameroon, which conform absolutely to the description of *argyrosticta* given by Plœtz. I am now convinced that I was in error in 1896 in regarding *C.* (*Apaustus*) *argyrosticta* as the female of the succeeding species, *C. flava* Hewitson = *C. charita* (Plœtz).

(475) 3. **Ceratrichia flava** Hewitson

Ceratrichia flava Hewitson, 1878, Ann. Mag. Nat. Hist., (5) I, p. 343. Holland, 1896, Proc. Zool. Soc. London, p. 79, Pl. III, fig. 14.
Plastingia charita Plœtz, 1879, Stett. Ent. Zeit., XL, p. 356.

One male taken at Batama, September 18, 1909.

(476) 4. **Ceratrichia wollastoni** Heron

Ceratrichia wollastoni Heron, 1909, Trans. Zool. Soc. London, XIX, p. 174, Pl. v, figs. 13, 14.

There are three specimens referable to this species which were taken at Medje, two in April, and one in September 1910. It is distinguished from *C. flava* Hewitson by the outline of the inner edge of the terminal black band of the primaries, which curves regularly from the inner margin before the lower angle to about the middle of the costa, whereas in *C. flava* it is angulated at vein 4, running inwardly for some distance along that vein towards the cell, which in most specimens it reaches and the outer extremity of which it covers somewhat diffusely. The insect was originally described from Ruwenzori; we also have specimens from the interior of Cameroon.

Before dismissing the consideration of the few species of this genus brought before us by the present collection, it is proper to state that it seems to the writer that it is much in need of a careful revision, inasmuch as the material constantly accumulating in his custody seems to indicate that some at least of the so-called species are of questionable validity.

ACROMECIS Mabille

Mabille, in the 'Genera Insectorum,' separates the species named *neander* Plœtz from the genus *Andronymus* Holland, to which I assigned it in 1896, and erects the genus *Acromecis* for its reception.

(477) 1. **Acromecis neander** (Plœtz)

Apaustus neander Plœtz, 1884, Stett. Ent. Zeit., XLV, p. 154.
Ancyloxypha producta Trimen, 1889, S. Afr. Butt., III, p. 334.
Andronymus neander Holland, 1896, Proc. Zool. Soc. London, p. 82, Pl. II, fig. 23.
Acromecis neander Mabille, 1904, Gen. Ins., XVII, p. 172.

There are ten specimens, eight males and two females. All were taken at Medje, except one female which is ticketted "Stanleyville, I, 27, 1915." Six of the specimens taken at Medje were captured in June, one in May, and one in September.

Cænides Holland

(478) 1. **Cænides cænira** (Hewitson)

Hesperia cænira Hewitson, 1867, Exot. Butt., IV, *Hesperia*, Pl. II, figs. 15, 16.
Pamphila cænira Kirby, 1871, Syn. Cat., p. 606.
Hesperia calpis Plœtz, 1879, Stett. Ent. Zeit., XL, p. 354; 1882, idem, XLIII, p. 328, ♀.
Hidari cænira Holland, 1896, Proc. Zool. Soc. London, p. 82, Pl. II, fig. 3, ♀ (*calpis* Plœtz).
Cænides cænira (*sic*) Mabille, 1904, Gen. Ins., XVII, p. 182.

One typical male collected at Medje, July 8, 1910.

In my catalogue of the African Hesperiidæ, 1896, I referred the foregoing and two other species to the genus *Hidari* Distant, with which they seemed to agree better than with any other genus at that time described. M. Mabille in his later work relegates them to my genus *Cænides*, of which he says they form a section. I cannot take the time at the moment of writing this to go fully into the matter, which might involve some detailed investigation of structures under the microscope and bleaching of wings, but I know that the *Hesperia cænira* of Hewitson is certainly very doubtfully congeneric with *Hesperia dacela* Hewitson, which is the type of the genus *Cænides* Holland.

(479) 2. **Cænides cylinda** (Hewitson)

Hesperia cylinda Hewitson, 1876, Ann. Mag. Nat. Hist., (4) XVIII, p. 449.
Pamphila calpis Karsch (*nec* Plœtz), 1893, Berl. Ent. Zeit., XXXVIII, p. 252, Pl. VI, fig. 4 (♀ *non* ♂).
Cænides cylinda Holland, 1896, Proc. Zool. Soc. London, p. 89, Pl. I, fig. 12 (♀ *non* ♂). Mabille, 1904, Gen. Ins., XVII, p. 182.

Two males, one taken at Leopoldville, July 4, 1909, the other at Niangara, November 20, 1910.

The figures of this insect given both by Karsch and myself do not represent the male but the female, which has a postmedian translucent spot on the hind wing, while the male is destitute of such a spot, as is shown by numerous specimens which have come into my possession or custody since 1896.

RHOPALOCAMPTA Wallengren

(480) 1. **Rhopalocampta bixæ** (Linnæus)

Papilio bixæ LINNÆUS, 1758, Syst. Nat., 10th Ed., p. 485. CLERCK, 1764, Icones, Pl. XLII, fig. 4.

Ismene bixæ KIRBY, 1871, Syn. Cat., p. 582 (part).

Rhopalocampta bixæ WATSON, 1893, Proc. Zool. Soc. London, p. 129. HOLLAND, 1896, Proc. Zool. Soc. London, p. 101. MABILLE, 1904, Gen. Ins., XVII, p. 88.

One good specimen taken at Medje, July 13, 1910.

(481) 2. **Rhopalocampta unicolor** (Mabille)

Ismene unicolor MABILLE, 1877, Ann. Soc. Ent. France, (5) VII, Bull., p. xxxix.

Hesperia unicolor TRIMEN, 1889, S. Afr. Butt., III, p. 375.

Rhopalocampta unicolor HOLLAND, 1896, Proc. Zool. Soc. London, p. 97. MABILLE, 1904, Gen. Ins., XVII, p. 88.

Six specimens: two taken at Gamangui in February; three captured at Medje in July; and one caught at Faradje, ticketted "1911–1912."

(482) 3. **Rhopalocampta forestan** (Cramer)

Papilio forestan CRAMER, 1782, Pap. Exot., IV, p. 210, Pl. CCCXCI, figs. *E*, *F*.

Ismene florestan TRIMEN, 1866, (part), Rhop. Afr. Austr., II, p. 318.

Hesperia florestan TRIMEN, 1889, S. Afr. Butt., III, p. 368.

Rhopalocampta forestan WATSON, 1893, Proc. Zool. Soc. London, p. 129. HOLLAND, 1896, Proc. Zool. Soc. London, p. 98.

Eight specimens are included in the collection; one taken at Gamangui in February, one at Medje in June, and six at Niangara in November 1910.

M. Mabille has omitted this species from his list given on page 88 of his work.

HETEROCERA

Amatidæ Hampson

(Syntomidæ of authors)

MYOPSYCHE Hampson

(483) 1. **Myopsyche langi,** new species

♂. Head and thorax black with a faint bluish gloss; antennæ black at the base (tips wanting in the type); frons black; a tuft of orange-red hairs behind each eye; patagia orange-red with a minute black spot at the base of each; first three segments of abdomen orange-red, the succeeding segments blue-black, except the last, which is pale reddish; the ventral surface of the thorax and the first three abdominal segments are pale fawn-colored, and the legs are of the same color, becoming slightly darker upon the femora. Fore and hind wings hyaline. The costa of the fore wing is narrowly blackish, as is also the posterior margin; the border of the external margin of the fore wing is broadly black at the apex, but rapidly decreases in width to the extremity of the second median nervule, and then suddenly widening inwardly and again diminishing to the inner angle, forms a subtriangular spot on the outer margin from the second submedian nervule to the angle. This black spot is ornamented by a minute white or hyaline spot between veins 2 and 3 near their extremities. At the end of the cell of the fore wing there is a subtriangular black spot. The black outer margin of the hind wing is relatively wide, and the costal margin is broadly black. The outer margin has an inwardly projecting tooth-like prolongation on vein 2. In consequence of the width of the black borders of the hind wing the inner hyaline area is much reduced, and restricted to the lower half of the cell, a small space beyond it, and the basal portion of the space between the cell and vein 1. Expanse ♀, 27 mm.

This species comes nearest *M. ochsenheimeri* (Boisduval) but is totally distinct, differing both in the markings of the wings and the abdomen. I name it in honor of the leader of the expedition upon the Lepidoptera collected by which I am reporting. The type, which is unique, was collected at Medje, August 6, 1910, and is in The American Museum of Natural History.

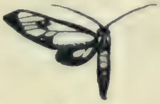


Fig. 2.
Myopsyche langi, ♂·$\frac{1}{1}$.

Trichæta Swinhoe

(484) 1. **Trichæta bivittata** (Walker)

Syntomis bivittata Walker, 1864, List Lep. Het. B. M., XXXI, p. 66.
Trichæta bivittata Hampson, 1898, Cat. Lep., Phal., I, p. 55.

One specimen taken at Malela, July 8, 1915.

Amata Fabricius

(*Syntomis* Ochsenheimer and others)

(485) 1. **Amata cerbera** (Linnæus)

Sphinx cerbera Linnæus, 1764, Mus. Lud. Ulr., p. 363.
Syntomis cerbera Hampson, 1898, Cat. Lep., Phal., I, p. 83.

One poor specimen, labelled as taken at Stanleyville, but without date.

(486) 2. **Amata marina** (Butler)

Syntomis marina Butler, 1876, Journ. Linn. Soc. London, Zool., XII, p. 348.
Syntomis ogovensis Holland, 1893, Psyche, VI, p. 374.

One defective specimen caught at Gamangui, June 17, 1910.

Meganaclia Aurivillius

(487) 1. **Meganaclia perpusilla** (Walker)

Anace perpusilla Walker, 1856, List Lep. Het. B. M., VII, p. 1720, ♂.
Metarctia perpusilla Hampson, 1898, Cat. Lep., Phal., I, p. 144, Pl. v, fig. 19.
Meganaclia carnea Hampson, 1898, Cat. Lep., Phal., I, p. 136, Pl. vi, fig. 27.
Meganaclia perpusilla Hampson, 1914, Cat. Lep., Phal., Suppl., I, p. 61.

One female, taken at Matadi, June 24, 1909.

Metarctia Walker

(488) 1. **Metarctia invaria** (Walker)

Anace invaria Walker, 1856, List Lep. Het. B. M., VII, p. 1720.

One male, labelled as taken at Stanleyville, but without date.

(489) 2. **Metarctia erubescens** Walker

Metarctia erubescens Walker, 1864, List Lep. Het. B. M., XXXI, p. 315.

A pair taken at Medje, July 1910.

(490) 3. **Metarctia lutea** Holland

Metarctia lutea Holland, 1893, Psyche, VI, p. 396.

A male caught in August and a female captured in June 1910, both at Medje.

Sir George F. Hampson in his Catalogue treats the last two forms here listed as being merely varieties of *M. invaria* (Walker). I find it difficult to agree with him. There are before me, as I write, some hundreds of specimens of Walker's species, representing numerous localities, and they all agree very closely; there are also some scores of each of the other two forms from widely separated localities, and these also agree closely and are easily distinguishable at a glance from typical *M. invaria* and from each other. Until the test of breeding shall have demonstrated the fact that these three forms are derived from one and the same batch of eggs, it appears to me preferable to distinguish them as species, instead of "lumping" them under Walker's name.

(491) 4. **Metarctia hæmatica** Holland

Metarctia hæmatica Holland, 1893, Psyche, VI, p. 396. Hampson, 1898, Cat. Lep., Phal., I, p. 147, Pl. v, fig. 26.

One male caught at Gamangui, February 5, 1910.

(492) 5. **Metarctia chapini,** new species

Plate XIII, Figure 4, ♀, type

♀. Antennæ and eyes black; frons, head, and thorax on the upper side black; abdomen on the upper side with the first six segments very pale pinkish, margined terminally with deep black, the remaining segments deep black; thorax and abdomen on the under side pale fuscous, the banding which is very conspicuous on the upper side being only faintly indicated on this side in the case of the anterior segments of the abdomen; legs dorsad pale pinkish, ventrad black. Fore wings on the upper side sooty black, without any trace of paler markings, on the under side pale fuscous, slightly darker near the apex, and at the base near the inner margin passing into pale pinkish. Hind wings on the upper side pale pink, the nervules and outer margin being slightly clothed with pale fuscous squamation, on the under side dark fuscous, except along the inner margin, where they are pale pink. Expanse, 45 mm.

The type, which is unique, was taken at Medje, June 26, 1910, and is in The American Museum of Natural History. I take pleasure in naming the species in honor of Mr. J. P. Chapin, one of the leaders of the expedition.

The species comes near *M. rubripuncta* Hampson, but may be easily distinguished from that species by the entire absence of the pale spots and markings of the upper side of the primaries, the very strongly contrasting banding of the upper side of the abdomen, and the pale color of the hind wings on the upper side.

(493) 6. **Metarctia** species

There are two specimens representing a very small species of the genus, which may possibly be new to science, and which were taken at Faradje, November 22, 1912. The specimens are, however, too badly rubbed to permit either of identification or description.

(494) 7. **Metarctia** species

There is a single specimen bearing the label "Avakubi, Lieut. Boyton, 1908," which I find difficulty in referring to any species hitherto described or figured. It is a male. Inasmuch, however, as the specimen does not appear to be in prime condition, I refrain from attempting to name or describe it, further than to say that the prevalent color of the primaries is pale fawn, with obscure lighter discocellular and postmedian markings on the primaries, and that it is a rather small species, less than 40 mm. in expanse of wings.

BALACRA Walker

(495) 1. **Balacra ehrmanni** (Holland)

Automolis ehrmanni HOLLAND, 1893, Psyche, VI, p. 535.

One female, labelled as taken at Bafwabaka in January 1910.

(496) 2. **Balacra pulchra** Aurivillius

Balacra pulchra AURIVILLIUS, 1892, Ent. Tidskr., XIII, p. 200.
Balacra glagoessa HOLLAND, 1893, Psyche, VI, p. 396.
Pseudapiconoma glagoessa HAMPSON, 1898, Cat. Lep., Phal., I, p. 151, Pl. VI, fig. 14.

One female caught at Medje, July 1910.

EUCHROMIA Hübner

(497) 1. **Euchromia lethe** (Fabricius)

Zygæna lethe FABRICIUS, 1775, Syst. Ent., p. 553.
Euchromia lethe HAMPSON, 1898, Cat. Lep., Phal., I, p. 296.

The collection contains twenty-one specimens, mostly males, taken as follows: Kwamouth, 1, July 1909; Stanleyville, 7, August 1909; Risimu, 1, September 1909; Avakubi, 1, October 1909; Medje, 2, July–August 1910; Niangara, 5, November 1910; Faradje, 4, November 1911.

(498) 2. **Euchromia guineënsis** (Fabricius)

Zygæna guineënsis FABRICIUS, 1775, Ent. Syst., p. 551.
Sphinx sperchia CRAMER, 1777, Pap. Exot., II, Pl. CXLVI, fig. *C*.
Euchromia sperchia HAMPSON, 1898, Cat. Lep., Phal., I, p. 296; 1914, idem, Suppl., I, p. 197.

There are three examples captured as follows: Stanleyville, 1909; Faradje, November 1912; Niangara, March 1913.

Arctiidæ

Nolinæ

NOLA Leach

(499) 1. **Nola bananæ**, new species

♀. Frons, tegulæ, and patagia pure snowy white; upper side of thorax and abdomen a shade darker, very pale gray; lower side of abdomen and thorax much darker gray; legs concolorous. On the upper side the fore wing is pale gray, growing slightly darker externally towards the outer margin; a dark gray spot of raised scales near the end of the cell; beyond it on the costa a larger dark gray subtriangular spot; a postmedian transverse, slightly curved line, composed of black dots on the interspaces, runs from the costa to the inner margin, followed by a submarginal row of smaller spots. The hind wings on the upper side are evenly pale fuscous. Both wings on the under side are uniformly gray, of a darker shade than on the upper side, but both have their inner margins narrowly lined with white. Expanse, 16 mm.

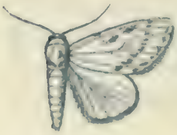


Fig. 3.
Nola bananæ, ♂. ♀.

The type, which is unique, was taken at Banana, June 21, 1909.

Lithosiinæ

CHIONÆMA Herrich-Schæffer

(500) 1. **Chionæma delicata** (Walker)

Bizone delicata WALKER, 1854, List Lep. Het. B. M., II, p. 550.
Chionæma delicata HAMPSON, 1900, Cat. Lep., Phal., III, p. 325, Pl. XXVII, fig. 28.

One female taken at Medje in June.

ASURA Walker

(501) 1. **Asura atricraspeda** Hampson (?)

Asura atricraspeda HAMPSON, 1914, Cat. Lep., Phal., Suppl., I, p. 766.

A specimen taken at Medje, July 17, 1910, is referred to this species with reasonable certainty, but it is too badly rubbed to make the identification positive.

Arctiinæ

DIACRISIA Hübner

(502) 1. **Diacrisia aurantiaca** (Holland)

Alpenus aurantiacus HOLLAND, 1893, Psyche, VI, p. 397.
Diacrisia aurantiaca HAMPSON, 1901, Cat. Lep., Phal., III, p. 275, Pl. XLIV, fig. 19.

One male, minus antennæ, caught at Medje, July 24, 1910.

(503) 2. **Diacrisia maculosa** (Stoll)

Bombyx maculosa STOLL, 1781, Pap. Exot., IV, Pl. CCCLXX, fig. *B*.

Four males and three females of this common species, all taken at Medje in June and July, except a male and a female caught at Faradje in December.

(504) 3. **Diacrisia curvilinea** (Walker)

Spilosoma curvilinea WALKER, 1855, List Lep. Het. B. M., III, p. 671.
Diacrisia curvilinea HAMPSON, 1901, Cat. Lep., Phal., III, p. 275, Pl. XLIV, fig. 4.

A female caught at Medje, September 27, 1910.

(505) 4. **Diacrisia** species (?)

A single male caught at Stanleyville, April 2, 1915, which agrees with specimens in my collection which are labelled *æqualis* Walker, which Hampson has sunk as a synonym of *maculosa* (Stoll). I compared my specimens with Walker's type, and do not regard them as being the same as *maculosa* (Stoll), but for the present do not wish to dogmatize and leave the insect unnamed.

(506) 5. **Diacrisia lutescens** (Walker)

Spilosoma lutescens WALKER, 1855, List Lep. Het. B. M., III, p. 672.
Diacrisia lutescens HAMPSON, 1901, Cat. Lep., Phal., III, p. 295.

One male of the almost white variety taken at Leopoldville, July 4, 1909.

ESTIGMENE Hübner

(507) 1. **Estigmene pura** (Butler)

Alpenus purus BUTLER, 1878, Proc. Zool. Soc. London, p. 382.
Estigmene pura HAMPSON, 1901, Cat. Lep., Phal., III, p. 343, Pl. XLVII, fig. 3.

A single female specimen, taken at Faradje in December 1912, is referred to this species.

RHODOGASTRIA Hübner

(508) 1. **Rhodogastria luteibarba** Hampson

Rhodogastria luteibarba HAMPSON, 1901, Cat. Lep., Phal., III, p. 502, Pl. L, fig. 18.

A single female caught at Medje, August 3, 1910.

(509) 2. **Rhodogastria vidua** (Cramer)

Noctua vidua Cramer, 1779, Pap. Exot., III, p. 127, Pl. cclxiv, fig. *C*.
Noctua mauritia Stoll, 1781, Pap. Exot., IV, Pl. cccxlv, fig. *B*.
Rhodogastria vidua Hampson, 1901, Cat. Lep., Phal., III, p. 503.

A solitary female in rather poor case collected at Medje, July 30.

Callimorphinæ

AMPHICALLIA Aurivillius

(510) 1. **Amphicallia pactolica** (Butler)

Plate XIII, Figure 2, ♀

Pleretes pactolicus Butler, 1888, Proc. Zool. Soc. London, p. 82.
Amphicallia pactolicus Aurivillius, 1899, Ent. Tidskr., XX, pp. 235, 238.

Two specimens, one taken at Ngayu, December 11, 1910, the other at Faradje, "1911–1912."

Aganainæ

DEILEMERA Hübner

(511) 1. **Deilemera leuconoë** (Hopffer)

Nyctemera leuconoë Hopffer, 1857, Monatsber. Akad. Wiss. Berlin, p. 422; 1862, Peters, Reise n. Mossambique, V, p. 430, Pl. xxviii, fig. 3.
Deilemera leuconoë Swinhoe, 1903, Trans. Ent. Soc. London, LI, p. 65.

Twenty-five specimens: one taken at Munie Katoto, September 10, 1909; three at Bafwabaka, January 1910; nine at Medje, one in March, the rest from June to August; ten at Niangara, November 1910.

(512) 2. **Deilemera fallax** (Holland)

Nyctemera fallax Holland, 1893, Ent. News, IV, p. 59, Pl. iii, fig. 10.
Deilemera fallax Swinhoe, 1903, Trans. Ent. Soc. London, LI, p. 65.

Thirty specimens, ten males and twenty females: one taken at Lubila and one at Risimu, in October 1909; one at Bafwabaka in January; two at Gamangui in February; the rest at Medje from June to August 1910.

(513) 3. **Deilemera** (?) **anomala**, new species

♂. Frons white, with a circular black spot in the middle; palpi, eyes, and antennæ black; a fine white line behind the eyes; some orange hairs on the anterior portion of the collar; tegulæ black, margined with white; patagia black, broadly margined with white; top of thorax whitish, traversed with a dark median longitudinal band; anterior segments of abdomen on the upper side whitish, the posterior segments more or less pale orange, a dorsal series of black spots; under side of thorax and abdomen yellowish orange, the legs black, bordered on the femora and tibiæ with fine white lines. Fore wings on the upper side white, narrowly black on the costa near the base, the black border rapidly widening about the middle of the costa and passing into the broad black outer margin, which covers the outer half of the wing, leaving the inner white area as a large outwardly evenly rounded spot, marked by a few dark rays upon the nervules near the base, and defined below by a fine black line upon vein 1. The upper side of the hind wing is similar in coloration to the fore wing, the broad black outer border beginning on the costa at a point about three-fourths of its length from the base, and extending to the anal angle, the white area projecting into it beyond the cell, and giving it at this point a somewhat angulated appearance. On the under side the wings are much as on the upper side.

♀. The female is like the male but the antennæ are not heavily pectinate but filiform, the wings are relatively broader, and the black outer margins of both wings are much reduced in width, and in some specimens on the hind wings are absent or only represented by a few marginal spots beyond the cell, though the part of the outer band at its beginning on the costa of the hind wing invariably persists. Expanse ♂, 35 mm.; ♀, 40 mm.

I have a long series of this insect which has stood in my cabinet for a quarter of a century awaiting description; there are numerous males and many females, taken at Benito and at Kangvé in the valley of the Ogové River. The presence of a single specimen of the aberrant form of the female, in which the outer margin of the hind wing is reduced to a few black spots, induces me at last to give it a name. I have little doubt of the correctness of the reference to the genus *Deilemera*. The types, from Benito, are in the Holland Collection in the Carnegie Museum, and I designate the female returned by the Lang-Chapin Expedition from Medje as a paratype.

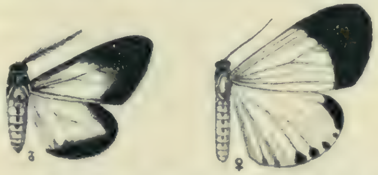


Fig. 4. *Deilemera anomala* Holland. $\frac{1}{1}$. The female is aberrant, not having the margin of the hind wing broadly black as is usually the case.

ARGINA Hübner

(514) 1. **Argina amanda** (Boisduval)

Euchelia amanda BOISDUVAL, 1847, Delegorgue, Voy. Afr. Australe, II, p. 597.
Argina amanda KIRBY, 1892, Cat. Lep. Het., p. 350. HAMPSON, 1910, Proc. Zool. Soc. London, p. 461.

Three specimens caught at Niangara, November 1910.

CARPOSTALAGMA Mabille

(515) 1. **Carpostalagma viridis** (Plœtz)

Caryatis (?) *viridis* PLŒTZ, 1880, Stett. Ent. Zeit., XLI, p. 80.

One specimen of this common insect taken at Medje in the first week of August 1910.

PHÆGORISTA Boisduval

(516) 1. **Phægorista similis** Walker

Phægorista similis WALKER, 1869, Proc. Nat. Hist. Soc. Glasgow, I, p. 332, Pl. v, fig. 5.
Phægorista helcitoides DEWITZ, 1879, Mitth. München. Ent. Ver., III, p. 32, Pl. II, fig. 4.

Seventeen specimens, mostly males, all taken at Medje or at Gamangui, the dates ranging from April to August.

Agaristidæ

XANTHOSPILOPTERYX Wallengren

(517) 1. **Xanthospilopteryx poggei** (Dewitz)

Eusemia poggei DEWITZ, 1879, Mitth. München. Ent. Ver., III, p. 31, Pl. II, fig. 3.
Xanthospilopteryx poggei HAMPSON, 1901, Cat. Lep., Phal., III, p. 562. JORDAN, 1913, Seitz, Gross-Schmett., XV, p. 2, Pl. *1b*.

Fourteen specimens, all females, twelve captured at Medje from June to August; one taken at Gamangui in June, and one at Niangara in November 1910.

(518) 2. **Xanthospilopteryx flaviventris** Jordan

Xanthospilopteryx flaviventris JORDAN, 1913, Seitz, Gross-Schmett., XV, p. 2, Pl. *1b*.

Two males taken at Medje, one in July, the other in August.

(519) 3. **Xanthospilopteryx æmulatrix** (Westwood)

Eusemia æmulatrix WESTWOOD, 1881, Oates' Matabeleland, p. 355.
Xanthospilopteryx æmulatrix JORDAN, 1913, Seitz, Gross-Schmett., XV, p. 4, Pl. *1f* (as *mabillei*).

One specimen taken at Munie Katoto in October 1909. I have a long series of this species taken on the Ogové River and in Spanish Guinea.

(520) 4. **Xanthospilopteryx batesi** Druce

Xanthospilopteryx (sic) batesi DRUCE, 1910, Ann. Mag. Nat. Hist., (8) V, p. 395.
Xanthospilopteryx batesi JORDAN, 1913, Seitz, Gross-Schmett., XV, p. 5, Pl. IV*f*.

The species is represented by two males and two females in fairly good condition, all taken at Medje, the females in July, the males in August. The type of the species described by Druce was a female, and the two females before me agree exactly with the description given by the author, but the males differ in that the hind wings on the under side are solidly black and without the "wide yellow band along the costal margin extending from near the base almost to the apex." The species was originally described from a specimen captured on the Ja River, Cameroon.

(521) 5. **Xanthospilopteryx medjensis,** new species

Plate XIII, Figure 1, ♂

♂. Somewhat closely resembling the insect figured in Seitz, Gross-Schmett., XV, Pl. 11*b*, and designated on the plate as *X. vittalbata.* I have been unable to discover any reference to this figure in the text written by Dr. Karl Jordan to accompany the plates. He apparently has made no reference to it unless he means to refer to it as *X. paucicolor*, where he speaks on page 3, under *X. gruenbergi* of such a species as figured on Pl. 11*b*. The insect before me differs, however, from that figured as *vittalbata* in having on the upper side of the primaries on the posterior margin behind the middle a large white subtriangular spot, divided by a deep black narrow line on vein 1. There are also a number of small and less clearly defined spots near the base on this wing.

The collection contains three specimens, a male and two females, taken at Medje, the male in April, the females in July. The type, ♂, and allotype, ♀, are in The American Museum of Natural History. A female paratype is in the Holland Collection in the Carnegie Museum.

POLACANTHOPODA Hampson

(522) 1. **Polacanthopoda tigrina** (Druce)

Hespagarista tigrina DRUCE, 1882, Proc. Zool. Soc. London, p. 778, Pl. LX, fig. 4.
Polacanthopoda tigrina HAMPSON, 1901, Cat. Lep., Phal., III, p. 573, fig.

Two defective specimens caught at Niangara in November.

CHARILINA Walker

(523) 1. **Charilina amabilis** (Drury)

Ægocera amabilis DRURY, 1773, Ill. Exot. Ent., II, Pl. XIII, fig. 3.
Charilina amabilis HAMPSON, 1901, Cat. Lep., Phal., III, p. 587, fig.

One male taken at Niangara, May 29, 1913.

METAGARISTA Walker

(524) 1. **Metagarista triphænoides** Walker

Metagarista triphœnoides WALKER, 1854, List Lep. Het. B. M., I, p. 61. HAMPSON, 1901, Cat. Lep., Phal., III, p. 592, fig.

One specimen taken at Medje, August 1910.

ÆGOCERA Latreille

(525) 1. **Ægocera rectilinea** Boisduval

Ægocera rectilinea BOISDUVAL, 1836, Spec. Gén. Lép., I, Pl. XIV, fig. 5.

One male, Ngayu, April 16, 1910.

(526) 2. **Ægocera latreillei** Herrich-Schæffer

Ægocera latreillii HERRICH-SCHÆFFER, 1853, Aussereur. Schmett., fig. 19.

One example caught at Niangara, March 21, 1913.

(527) 3. **Ægocera obliqua** Mabille

Ægocera obliqua Mabille, 1893, Ann. Soc. Ent. Belgique, XXXVII, p. 56. Jordan, 1913, Seitz, Gross-Schmett., XV, Pls. III*f*, III*g*.

Four examples: two rubbed females taken at Medje, one in May, the other in September; two males, one caught at Munie Katoto, September 10, 1909, the other at Niangara, March 21, 1913.

SCHAUSIA Karsch

(528) 1. **Schausia transiens** (Jordan ?)

In the copy of Seitz, Gross-Schmett., XV, Pl. II*e*, there is figured a form of *Schausia* to which the specific name *transiens* is applied on the plate. Unfortunately in my copy of the work so far as received the text only extends to and includes page 14. I have therefore no means of running down the author of this specific name and have failed to detect it by a close search of the Zoological Record. The Lang-Chapin Collection contains one specimen of this form taken at Medje in August. I have other specimens taken in Cameroon, which have been awaiting determination or description. It is very near *S. gladiatoria* Holland, but larger and the basal white spot on the primaries on the upper side is different in form and location.

MASSAGIDIA Hampson

(529) 1. **Massagidia hesparia** (Cramer)

Geometra hesparia Cramer, 1775, Pap. Exot., I, Pl. LVI, fig. *C*.
Massagidia hesparia Hampson, 1901, Cat. Lep., Phal., III, p. 645, fig. ♂.

There is a male which I refer to this species. It was taken at Medje in the first week of September 1910. The white mesial band of the secondaries is a trifle broader than in Hampson's figure.

Noctuidæ

Hadeninæ

CIRPHIS Walker

(530) 1. **Cirphis prominens** (Walker) (?)

Leucania prominens Walker, 1856, List Lep. Het. B. M., IX, p. 102.
Cirphis prominens Hampson, 1905, Cat. Lep., Phal., V, p. 487.

With considerable doubt I refer to this species a specimen taken at Boma, June 23, 1909. It is very near *C. prominens*, but shows differences which might justify its description as an hitherto undescribed species, but with only one individual before me, and that not in the best of case, I do not feel justified in describing it as new.

(531) 2. **Cirphis polyrabda** Hampson (?)

Cirphis polyrabda HAMPSON, 1905, Cat. Lep., Phal., V, p. 507.

There is one specimen, caught at Matadi, June 24, 1909, which agrees better upon the whole with the figure and description of *C. polyrabda* Hampson than with any other species in the literature of the subject. I am not, however, absolutely sure of the correctness of this reference.

BOROLIA Moore

(532) 1. **Borolia apparata** (Wallengren)

Leucania apparata WALLENGREN, 1875, Öfvers. Sv. Vet.-Akad. Förh., XXXII, p. 105.
Borolia apparata HAMPSON, 1905, Cat. Lep., Phal., V, p. 557, fig.

A solitary specimen caught at Matadi, June 24, 1909, agreeing well with the figure and description given by Hampson.

(533) 2. **Borolia** species (?)

There is a single specimen taken at Boma, June 23, 1909, which seems to be nearer the species named *B. acrapex* by Hampson than any other. It does not, however, exactly fit either the description or figure, the latter to be found on Pl. xcv, fig. 3. Hampson speaks of the insect as being "pinkish," but I cannot detect any trace of "pink" on the specimen before me. Upon the whole, it otherwise agrees very closely with the figure given by Hampson, except that the "postmedian series of black points" in the fore wing seem to be lacking or excessively indistinct in the specimen upon which I am reporting.

BRITHYS Hübner

(534) 1. **Brithys pancratii** (Cyrillo)

Noctua pancratii CYRILLO, 1787, Ent. Neapol., Pl. XII, fig. 4.
Brithys pancratii HAMPSON, 1905, Cat. Lep. Phal., V, p. 447 (*q. v.* for synonymy).

One male example caught at Niangara, March 22, 1913. The insect is common on the tropical West Coast and we have many specimens from Cameroon and the French Congo, some *ex larva*.

Acronyctinæ

PRODENIA Guenée

(535) 1. **Prodenia litura** (Fabricius)

Noctua litura FABRICIUS, 1775, Syst. Ent., p. 601.
Prodenia litura HAMPSON, 1909, Cat. Lep., Phal., VIII, p. 245.

Two specimens, one caught at Boma, June 23, 1909, the other at Medje, April 6, 1910.

Euteliinæ

CALIGATUS Wing

(536) 1. **Caligatus angasi** Wing

Caligatus angasii WING, 1849, Proc. Zool. Soc. London, p. 104, Pl. *Annulosa* XIV, figs. 2, 3.

Pacidara venustissima WALKER, 1865, List Lep. Het. B. M., XXXIII, p. 830. HAMPSON, 1912, Cat. Lep., Phal., XI, p. 3, fig. 2.

One female taken at Avakubi in May 1914.

EUTELIA Hübner

(537) 1. **Eutelia subrubens** (Mabille)

Penicillaria subrubens MABILLE, 1890, Ann. Soc. Ent. France, (6) X, p. 40.

Eutelia subrubens HAMPSON, 1912, Cat. Lep., Phal., XI, p. 50, fig.

Two specimens, one labelled "Basoko, VII, 21, '09," the other "Faradje, 1911–1912."

(538) 2. **Eutelia nigricans,** new species

Plate XIII, Figure 8, ♂

♂. Antennæ black; head and thorax dark plumbeous; abdomen the same color, inclining on the upper side to reddish and on the lower side becoming distinctly redder; legs brown, tarsi annulated with pale gray; fore wings with basal half dark brown or blackish; a V-shaped flesh-colored mark on the costa about the end of the cell, and a short bar of the same color on the inner margin a little beyond the middle, these two marks indicating the outer limits of the darker basal area of the wing; a dark suborbicular shade follows the V-shaped mark on the costa; the outer half of the wing is paler plumbeous, lightest on the outer margin below the apex, and clouded with blackish on the outer margin near the extremity of vein 4; hind wing blackish, darkest externally; on the under side the wings are grayish, on the fore wing paler near apex; the hind wing with the upper margin at the base narrowly whitish; a diffuse discal spot in the cell, succeeded by three or four indistinct transverse bands made up of minute dark spots. Expanse, 27 mm.

The type, which is unique, was taken at Bolengi, July 20, 1909, and is in The American Museum of Natural History.

Sarrothripinæ

RISOBA Moore

(539) 1. **Risoba lunata** (Mœschler)

Lycoselene lunata MŒSCHLER, 1888, Abhandl. Senck. Nat. Ges., XV, p. 88, Pl. fig. 19.

One badly rubbed specimen taken at Medje, August 2, 1910.

Gonopterinæ

Pseudogonitis Hampson

(540) 1. **Pseudogonitis variabilis,** new species

Plate XIII: Figure 5, ♂; Figures 6 and 7, ♀ ♀

♂, ♀. Palpi porrect, ascending, the third joint moderately long and slender; the fore wing rounded on the costa before the apex, slightly incurved about the middle, strongly produced at the extremity of vein 4 and deeply excavated between tip of apex and this point; fringes of fore wing crenulate from apex to tornus; eyes dark brown; palpi dark brown, lighter below; frons, vertex, tegulæ, patagia and upper side of thorax varying from rufous to gray; tegulæ always marked externally by a paler line defined inwardly by a darker line; the upper side of the abdomen ranging from pale reddish or gray to dark fuscous in some specimens. Lower side of thorax and abdomen concolorous with the upper side; legs concolorous, tarsi darker brown, marked at the end of the joints with minute white spots. The fore wing indicates the presence of transverse basal, subbasal, median, postmedian, and submarginal bands, more or less obliterated upon the disc of the wing, but always persisting on the costal margin, where these bands are represented by five spots, the first three of which may or may not be continued downward across the wing in the form of macular bands. The submarginal band in all specimens which I have examined persists in the form of a subtriangular dark, spot on the costa, its outer margin being about 4 mm. from the apex, whence it is continued downward across the wing in a very irregular sinuate band composed of dark more or less sagittate spots, which sometimes fuse with each other and form a solid band. The upper or costal end of this submarginal band is in all specimens before me defined externally by a fine white line extending from the costa as far as vein 6, the space between this line and the apex being in most specimens lighter. Near the extremity of vein 4 the outer margin is obscured by dark spots and shades. In one specimen before me the entire outer third of the wing is almost solidly dark brown. The hind wing on the upper side has the inner two-thirds paler and the outer third banded with a darker shade varying from pale gray in some specimens to deep black, with the region of the anal angle always somewhat lighter. On the under side the wings are some shade of pale brown or gray, except on the inner margin of the fore wing, which from the base below the cell to the outer angle is paler, whitish or pale testaceous; at the end of the cell there is invariably a dark spot, and on the costa the spots which on the upper side indicate the location of the transverse bands may or may not faintly reappear on the lower side. Before the apex, near the costa, there is a small dark spot, indicating the point at which on the upper side the submarginal band appears; below this spot, from vein 2 to vein 5, in all specimens examined by me there is a broad black ferruginous spot, suboval in form, beyond which the outer margin is paler, marked with small pepper-and-salt maculations, the marginal line being regularly looped, dark in color with minute white points at the end of the nervules, the fringes being pale, tipped at their extremities with dark brown or blackish. The hind wing on the under side invariably has a minute discal spot at the end of the cell followed by two parallel very fine more or less irregularly curved postmedian and submarginal bands, which in some specimens become diffuse, and in some specimens as they approach the inner margin of the hind wing—which none of them reach—become intensified or are indicated by patches of minute black spots. The marginal line on the hind wing is like that on the fore wing, very fine, composed of regularly curved brown lines interrupted with white points at the tips of the nervules, beyond which the fringes are lighter, becoming a little darker toward their tips near the anal angle, but not near the upper angle, where they appear to be concolorous.

The foregoing description is based upon two male specimens, each of which has an expanse of 45 mm., and five female specimens, which expand from 43 to 48 mm., and which are contained in the Carnegie Museum. The male type was taken at Lolodorf, Cameroon, December 17, 1914, by J. A. Reis; the female allotype was taken at Banza Manteka, Belgian Congo, by A. L. Bain. Of the paratypes, three were taken at Lolodorf, two by J. A. Reis and one by H. L. Weber, at various dates; the fourth taken at Duala, Cameroon, on June 13, 1913, by A. I. Good.

Of this insect there are in the Lang-Chapin Collection five ragged and rubbed specimens taken at Medje in July and August, and I have several equally poor and defective specimens in my own collection coming from the region of the Ogové River, which I took with me to the British Museum in 1905 for determination, and one of which bears the mark "not in B. M." I have long known this insect by defective specimens, unfit for description, but it is only comparatively recently that we received from Cameroon a number of beautifully perfect specimens which have enabled me to prepare the foregoing diagnosis of the species, which I refer without hesitation to the genus *Pseudogonitis* Hampson, with which, according to the figures and description given by Hampson, it agrees perfectly. The insect is evidently exceedingly variable, the variation being due to the difference in the intensity of the bands and markings, which may become almost obsolete, or may become very deep and pronounced in color, or melt into each other. There is, however, more or less uniformity shown in the markings on the under side of the wings.

Acontiinæ

METALEPTINA Holland

(541) 1. **Metaleptina digramma** (Hampson)

Westermannia digramma HAMPSON, 1905, Ann. Mag. Nat. Hist., (7) XVI, p. 592.
Metaleptina digramma HAMPSON, 1912, Cat. Lep., Phal., XI, p. 623, fig.

One specimen taken at Bolengi, July 20, 1909.

LEOCYMA Guenée

(542) 1. **Leocyma congoënsis,** new species

Plate XIII, Figure 13, ♂

♂. Head and body pale reddish yellow; legs concolorous; traces of an indistinct median line and of a discal spot on the fore wing; both fore and hind wings on the upper side broadly shaded with light brown, this brown area separated from the light yellow inner area by two fine parallel dark brown lines between which there appear a few lighter reddish scales. The dark outer area of the fore wing is interrupted at the apex by a white sublunulate spot defined inwardly by a thin dark brown line; there are a few white punctulations opposite the end of the cell and near the tornus on this dark outer marginal area in the fore wing. Expanse, 30 mm.

The type, which is unique, was taken at Ukaturaka, on July 24, 1909, and is in The American Museum of Natural History.

Catocalinæ

COCYTODES Guenée

(543) 1. **Cocytodes maura** (Holland)

Arcte maura HOLLAND, 1894, Psyche, VII, p. 50, Pl. II, fig. 2.

Cocytodes maura HAMPSON, 1913, Cat. Lep., Phal., XII, p. 261, fig.

Seven specimens were taken at Medje, two in June and five in August.

EGYBOLIS Boisduval

(544) 1. **Egybolis vaillantina** (Stoll)

Bombyx vaillantina STOLL, 1790, Supp. to Cramer, Pl. XXXI, fig. 3.

One specimen labelled "Ukaturaka, July 24, 1909."

NYCTIPAO Hübner

(545) 1. **Nyctipao walkeri** (Butler)

Patula walkeri BUTLER, 1875, Ann. Mag. Nat. Hist., (4) XVI, p. 406. SAALMÜLLER, 1891, Lep. Madag., II, p. 450, Pl. IX, fig. 137.

Nyctipao valceri HAMPSON, 1913, Cat. Lep., Phal., XII, p. 283.

Five examples of this common insect; one taken at Stanleyville, January 1909; another at Avakubi, June 1914; the rest at Medje, August 1910.

Cyligramma Boisduval

(546) 1. **Cyligramma latona** (Cramer)

Noctua latona CRAMER, 1779, Pap. Exot., I, p. 20, Pl. XIII, fig. *B*.

Cyligramma latona HAMPSON, 1913, Cat. Lep., Phal., XII, p. 303.

Two males, one caught at Medje in September, the other at Avakubi in October.

(547) 2. **Cyligramma magus** (Guérin)

Erebus magus Guérin, 1842, Icon. Règne Anim., Ins., p. 521.
Cyligramma magus Hampson, 1913, Cat. Lep., Phal., XII, p. 305, Pl. ccv, figs. 6, 7.

One specimen caught at Munie Katoto in September 1909 and five captured at Medje from July to September 1910.

ENTOMOGRAMMA Guenée

(548) 1. **Entomogramma pardus** Guenée

Entomogramma pardus Guenée, 1852, Noct., III, p. 205. Hampson, 1913, Cat. Lep., Phal., XII, p. 315, fig.

One female caught at Niangara toward the end of November. It is paler and yellower than specimens from the West Coast, but, except for the lighter color, does not differ at all from other specimens, of which I have many before me.

THERMESIA Hübner

(549) 1. **Thermesia** species (?)

A single specimen taken at Bolengi, July 21, 1909, which I do not find any description to fit. I have several of the same species in my collection, one of which is marked "In B. M. but unnamed." This note was made in 1905, since which time Sir George F. Hampson may have given a name to the insect, which will appear in future volumes of his 'Catalogue of the Phalænæ,' and I am not inclined to "steal his thunder."

ENMONODIA Walker

(550) 1. **Enmonodia occidentalis** Hampson

Enmonodia occidentalis Hampson, 1913, Cat. Lep., Phal., XII, p. 322, Pl. ccviii, figs. 2, 3.

Three males, one taken at Gamangui in June, one at Medje in August, and one at Niangara in November.

SPEIRIDONIA Hübner

(551) 1. **Speiridonia plicata** Hampson

Speiridonia plicata Hampson, 1910, Proc. Zool. Soc. London, p. 429, Pl. xxxvii, fig. 25.

One specimen caught at Medje, August 24, 1910.

DERMALEIPA Saalmüller

(552) 1. **Dermaleipa nubilata,** new species

Plate XIII, Figure 15, ♂

♂. Head, thorax, and abdomen on the upper side pale reddish brown. The palpi are a little darker. The pectus and the lower side of the thorax and abdomen are paler than the upper side. The legs are reddish brown, darker in color than the adjacent parts of the body. On the upper side the fore wing is reddish brown of the same shade and intensity as the thorax with darker markings. There is a minute dark point in the middle of the cell; at the end of the cell there is a sublunate paler spot, surrounded by a very fine outer dark line, most distinct basad; at a point a little beyond the middle of the costa there arises a transverse straight postmedian pale line, which runs from this point to the inner margin, which it reaches a little behind the lower angle of the wing; there is no evidence of a basal or subbasal line, and there is a mere suggestion of a premedian line running from the costa to the inner margin; an inwardly curved submarginal line is suggested by a row of small dark dots; all of these lines are very obscure and poorly defined. Behind the postmedian line and below the lower outer angle of the cell there is a dark brown diffuse subtriangular spot, and beyond this line on the apical area there is a much larger spot of the same dark shade, the boundaries of which are not sharply defined, but which has the general outline of a triangle with its base on the costa from the point of origin of the postmedian line to the tip of the wing, and its apex on vein 5. The hind wing on the upper side is ochreous, and has on its inner margin a large tuft of long hairs, which are a trifle darker than the rest of the wing. On the under side both wings are uniformly ochreous a trifle deeper in shade than the upper side of the hind wing. The only dark marking on this side of the wings is a vaguely defined short band of dark scales at the end of the cell of the fore wing. Expanse, 45 mm.

The type, which is unique, was taken at Avakubi, August 30, 1910, and is in the American Museum of Natural History.

This small species may be easily distinguished from *D. arcifera* Hampson, which it comes nearest, by the absence of the subbasal line of the fore wing, its smaller size, the peculiar dark spots and the generally clouded and diffuse character of the markings of the fore wings.

(553) 2. **Dermaleipa parallelipipeda** (Guenée)

Ophiodes parallelipipeda Guenée, 1852, Noct., III, p. 230.
Dermaleipa parallelipipeda Hampson, 1913, Cat. Lep., Phal., XII, p. 412, fig.

One damaged female taken at Medje, April 6, 1910.

ANUA Walker

(554) 1. **Anua producta** (Holland) (*nec* Hampson)

Minucia producta Holland, 1894, Psyche, VII, p. 70, Pl. III, fig. 2.

One male specimen taken at Gamangui, February 11, 1910. It agrees perfectly with the type of the species, with which I have compared it.

Sir George F. Hampson, in his 'Catalogue of the Phalænæ,' XII, p. 453, gives a good description and a fine figure of an insect, which he determined to be the one to which I applied the specific name *producta*, as above cited. I am quite positive that he is in error. Neither his description nor his figure agree with the type of *Anua* (*Minucia*) *producta* Holland, which is before me as I am writing these lines. I have specimens of the insect described and figured by Hampson under the name *producta*, and have compared them with the type of *producta* and find them not to be the same. As the insect which Hampson dealt with evidently is not the same as *Anua producta* Holland and does not seem to have been named by any subsequent writer, I propose to call it **Anua hampsoni** and so have labelled the specimens in our collections. The synonymy will be as follows:

Anua hampsoni HOLLAND, new name.
Anua producta HAMPSON, 1913, Cat. Lep., Phal., XII, p. 453.

(555) 2. **Anua david** (Holland)

Minucia david HOLLAND, 1894, Psyche, VII, p. 70.
Anua david HAMPSON, 1913, Cat. Lep., Phal., XII, p. 456, fig.

The collection contains a rather poorly preserved specimen of this species which agrees with the type. It was taken, according to the label, at "Faradje, 1911–1912."

HELIOPHISMA Hampson

(556) 1. **Heliophisma catocalina** (Holland)

Ophiodes catocalina HOLLAND, 1894, Ent. News, V, p. 58.
Heliophisma catocalina HAMPSON, 1913, Cat. Lep., Phal., XII, p. 462, Pl. CCXVI, fig. 1.

One specimen taken at Medje, July 17, 1910, which agrees with the type.

TOLNA Walker

(557) 1. **Tolna eximia** (Holland)

Methorasa (?) *eximia* HOLLAND, 1894, Psyche, VII, p. 7; 1893, idem, VI, Pl. XXI, fig. 7.

There is a single specimen of this species, which I originally referred to *Methorasa* but which would better be referred to the genus *Tolna*. It was taken at Medje, July 30, 1910.

(558) 2. **Tolna bolengensis,** new species

Plate XIII, Figure 9, ♂

♂. Antennæ very slightly, if at all, pectinate; eyes dark brown; frons pale; tegulæ and patagia dark brown, the latter bordered posteriorly with fine white lines; metathoracic tuft dark brown; upper side of abdomen fuscous; palpi dark brown, minutely tipped with white at the end of the third joint; pectus dark brown, legs pinkish brown. Lower side of abdomen pale pinkish. Fore wing on the upper side pinkish brown, broadly margined externally with dark brown; near the base of this wing, below the cell, are some obscure dark transverse lines margined externally by paler brown; the reniform at the end of the cell is light in color, in one specimen white, in the other pale yellow, with a small black dot at the upper end and a minute U-shaped mark at the lower end; from the reniform to the inner margin there runs an irregular dark line, defined outwardly by a paler line, bounding a light postmedian area which extends as an irregular band from the costa to the inner area, but is interrupted just beyond the reniform at the end of the cell by a dark brown quadrate blotch. This transverse band is bounded externally by an irregularly curved postmedian line running from a point about 3 mm. behind the apex almost directly to vein 2, where it turns outwardly and terminates on the inner margin about 2 mm. from the tornus. This line constitutes the inner boundary of the dark external margin of the wing, and is defined inwardly by a few light scales. The fringes are separated from the body of the wing by an exceedingly fine black marginal line, the interspaces being punctated by very minute white dots, more distinct toward the tornus. On the upper side the hind wings toward the outer margin are sooty, paler toward the base; the fringes concolorous. On the under side both wings are prevalently tawny ochraceous sprinkled with very small brown dots; the fore wing has a whitish point near the base; a larger whitish spot corresponding to the reniform in its location, punctated above by a black dot. Beyond this light spot the dark blotch which appears on the upper side is faintly reproduced on the lower side, and externally is continued to the costa by a fine evenly curved dark line; the lower portion of the cell and the area included by the interspaces from the inner margin as far upward as vein 7 are fuliginous, except on the outer border, which is lighter. There is a small blackish dot between veins 7 and 8 behind the apex. The hind wing on the lower side is colored like the fore wing. There is a small black dot at the end of the cell, followed by an irregularly curved fine dark brown line; a dark subterminal fuliginous band runs from the upper angle toward the anal angle, which it does not quite reach. The anal angle and the inner margin are pale stramineous; the outer border is pale fuscous irrorated with brown, the division between the subterminal dark band and the outer area of the wing being marked by an irregularly curved row of light spots. In the cotype the dark subterminal band is not as heavy as in the type and is more or less broken up into small salt-and-pepper dots. Expanse, 43 mm.

The species is represented in the collection by two specimens, the type taken at Bolengi, July 20, 1909, and deposited in The American Museum of Natural History; the paratype taken at Poko, July 19, 1913, and reserved for the Holland Collection in the Carnegie Museum.

ERCHEIA Walker

(559) 1. **Ercheia subsignata** (Walker)

Achæa subsignata WALKER, 1865, List Lep. Het. B. M., XXXIII, p. 959. HOLLAND, 1894, Psyche, VII, Pl. II, fig. 9.

There is one rubbed female specimen of this species which on the under side (the upper side is too badly rubbed to be well identified) agrees absolutely with specimens originally compared with Walker's types and in my collection. The insect was captured at Gamangui on June 27, 1910.

Hampson, in his 'Catalogue of the Phalænæ,' XII, p. 495, sinks *Ercheia periploca* Holland as a synonym of *E. subsignata* (Walker). Hampson may be right, though the two insects look wonderfully distinct.

It is true that on the upper side there is considerable variation in specimens. I have in my collection a specimen of *E. subsignata* in which the light area of the fore wings is not glaucous gray, as in Walker's type, but bright yellowish ochraceous, giving the insect a totally different appearance at first glance.

In this connection it may be proper to call attention to the fact that we have in our possession a female specimen of *Ercheia multilinea* Swinhoe, originally described from Perak and also found in New Guinea. The specimen we have came from Sierra Leone and was donated to the Carnegie Museum by Mr. Schaus, having been collected by Mr. Clements. The geographic range of this species is thus extended from the Indo-Malayan region to tropical West Africa.

ACHÆA Hübner

(560) 1. **Achæa mormoides** Walker

Achæa mormoides WALKER, 1858, List. Lep. Het. B. M., XIV, p. 1393. HAMPSON, 1913, Cat. Lep., Phal., XII, p. 502, figure of ♂.
Achæa mania FELDER, 1874, Reise Novara, Lep., Pl. CXVI, fig. 16.

I refer one rubbed and faded female specimen to this somewhat variable species, of which I possess a long series representing both sexes. A female from the Ogové River agrees absolutely with the insect upon which I am reporting and which is labelled "Bolengi, VII, 20, '09."

(561) 2. **Achæa ezea** (Cramer)

Phalæna ezea CRAMER, 1779, Pap. Exot., III, p. 78, Pl. CCXXXIX, fig. *D*.
Achæa ezea HAMPSON, 1913, Cat. Lep., Phal., XII, p. 510. (Hampson gives further synonymy.)

One specimen taken at Avakubi, August 30, 1913.

(562) 3. **Achæa catocaloides** Guenée

Achæa catocaloides GUENÉE, 1852, Noct., III, p. 245. HAMPSON, 1913, Cat. Lep., Phal., XII, p. 514, Pl. CCXVII, fig. 13.

One example labelled "Bolengi, VII, 20, '09."

(563) 4. **Achæa albifimbria** (Walker)

Ophiusa albifimbria WALKER, 1869, Char. Undescrib. Lep. Het., p. 53.
Naxia apicaplaga HOLLAND, 1894, Ent. News, V, p. 59, Pl. II, fig. 3.
Achæa albifimbria HAMPSON, 1913, Cat. Lep., Phal., XII, p. 531, Pl. CCXVIII, fig. 14.

Two specimens, one caught at Medje in April 1910, the other at Stanleyville in March 1915.

(564) 5. **Achæa** species (?)

There is a single specimen taken at Medje, September 11, 1910, which I refer with considerable doubt to the genus *Achœa* because of the somewhat angulated outer margin of the fore wing. It does not agree with any species the figure and description of which I can recall, but I hesitate to describe it as new.

PARALLELIA Hübner

(565) 1. **Parallelia algira** (Linnæus)

Noctua algira LINNÆUS, 1767, Syst. Nat., 12th Ed., p. 836.
Parallelia algira HAMPSON, 1913, Cat. Lep., Phal., XII, p. 596 (*q. v.* for synonymy).

One specimen caught at Niangara, November 17, 1910.

GRAMMODES Guenée

(566) 1. **Grammodes stolida** (Fabricius)

Noctua stolida FABRICIUS, 1775, Syst. Ent., p. 599.
Grammodes stolida HAMPSON, 1913, Cat. Lep., Phal., XIII, p. 21 (*q. v.* for synonymy).

One female caught at Faradje, December 6, 1913.

PARACHALCIOPE Hampson

(567) 1. **Parachalciope benitensis** (Holland)

Grammodes benitensis HOLLAND, 1894, Psyche, VII, p. 85, Pl. II, fig. 25.
Parachalciope benitensis HAMPSON, 1913, Cat. Lep., Phal., XIII, p. 37, fig. p. 38.

Five specimens taken at Medje from April to August 1910.

MOCIS Hübner

(568) 1. **Mocis repanda** (Fabricius)

Noctua repanda FABRICIUS, 1794, Ent. Syst., III, p. 49.
Mocis repanda HAMPSON, 1913, Cat. Lep., Phal., XIII, p. 84. (See Hampson, *loc. cit.*, for full synonymy.)

Two specimens, one caught at Medje, April 6, 1910, the other at Faradje in "1911–1912."

(569) 2. **Mocis frugalis** (Fabricius)

Noctua frugalis FABRICIUS, 1775, Syst. Ent., p. 601.
Mocis frugalis HAMPSON, 1913, Cat. Lep., Phal., XIII, p. 87.

One typical specimen taken at Banana, June 21, 1909. Four specimens with the blackish suffused streak near the posterior margin of the primaries (Var. 1 of Hampson). Three of these were taken at Banana as the same date as the typical specimen, the fourth at Matadi four days afterwards.

(570) 3. **Mocis undata** (Fabricius)

Noctua undata Fabricius, 1775, Syst. Ent., p. 600.
Mocis undata Hampson, 1913, Cat. Lep., Phal., XIII, p. 91.

One specimen taken at Kwamouth, July 15, 1909.

(571) 4. **Mocis inornata** (Holland)

Trigonodes inornata Holland, 1894, Psyche, VII, p. 86, Pl. ii, fig. 19.
Mocis inornata Hampson, 1913, Cat. Lep., Phal., XIII, p. 99, Pl. ccxxiii, fig. 26.

Three poor specimens, all more or less rubbed and torn, one taken at Ngayu on December 24, 1909, the other two at Medje in August 1910.

(572) 5. **Mocis** species (?)

A solitary specimen taken at Banana, June 21, 1909, does not belong to any of the four above-mentioned species but is in too poor condition to permit of exact determination.

Mominæ

Elæodes Hampson

(573) 1. **Elæodes virescens** (Butler)

Eremobia virescens Butler, 1879, Ann. Mag. Nat. Hist., (5) IV, p. 243.
Elæodes virescens Hampson, 1913, Cat. Lep., Phal., XIII, p. 357, fig.

A single rubbed specimen, which is undoubtedly referable to this species, was taken at Medje, August 24, 1910.

Plusiinæ

Phytometra Haworth

(*Plusia* of authors)

(574) 1. **Phytometra acuta** (Walker)

Plusia acuta Walker, 1857, List Lep. Het. B. M., XII, p. 922.
Phytometra acuta Hampson, 1913, Cat. Lep., Phal., XIII, p. 490.

One specimen caught at Medje in August 1910 agrees with specimens in my collection which were compared with Walker's type of this species.

(575) 2. **Phytometra orichalcea** (Fabricius)

Noctua orichalcea Fabricius, 1775, Syst. Ent., p. 607.
Phytometra orichalcea Hampson, 1913, Cat. Lep., Phal., XIII, p. 580.

One specimen was caught at Faradje, December 6, 1912.

Noctuinæ

Ophideres Boisduval

(576) 1. **Ophideres fullonica** (Linnæus)

Phalæna-Attacus fullonica Linnæus, 1767, Syst. Nat., 12th Ed., I, part 2, p. 812.
Ophideres fullonica Hampson, 1894, Moths of India, II, p. 560.

One specimen was caught at Medje, July 6, 1910.

(577) 2. **Ophideres materna** (Linnæus)

Phalæna-Noctua materna Linnæus, 1767, Syst. Nat., 12th Ed., I, part 2, p. 840.
Ophideres materna Hampson, 1894, Moths of India, II, p. 561.

Three examples, one taken at Medje in June 1910, one at Faradje on January 1, the third at Niangara in May 1913.

(578) 3. **Ophideres princeps** Boisduval

Ophideres princeps Boisduval, 1832, Voy. de l'Astrolabe, Lép., p. 245. Walker, 1857, List Lep. Het. B. M., XIII, p. 1223.

Three specimens, which agree well with the figure given by Guenée (Noct., Pl. xvi, fig. 3). Originally described as from New Guinea, but this was probably a mistake of locality. I observe that Swinhoe in his 'Catalogue of Eastern Lepidoptera Heterocera' does not cite the species from the Indo-Malayan Region. Two of the specimens were caught at Medje in June and July, while one is labelled "Panga, IX, 16, 1914." We have many specimens in our collections from West Africa.

(579) 4. **Ophideres divitiosa** Walker

Ophideres divitiosa Walker, 1869, Proc. Nat. Hist. Soc. Glasgow, I, p. 356, Pl. vii, fig. 11.

Three specimens taken at Medje in July and August not differing from others in our collections from other localities in tropical Africa.

SPHINGOMORPHA Guenée

(580) 1. **Sphingomorpha chlorea** (Cramer)

Phalæna-Noctua chlorea Cramer, 1779, Pap. Exot., II, Pl. civ, fig. *C*.
Sphingomorpha chlorea Swinhoe, 1900, Eastern Lep. Het., II, p. 132.

Nineteen specimens, all taken at Niangara, except two taken at Medje. The examples from Niangara were caught in March and April 1913; those from Medje in April and in July.

(581) 2. **Sphingomorpha pudens** Holland

Sphingomorpha pudens Holland, 1894, Ent. News, VII, p. 57, Pl. ii, fig. 7.

Of this species there are four specimens, two males and two females. One female was caught at Matadi in June 1909, the other at Ngayu in April 1910. The two males were taken at Medje in July 1910.

(582) 3. **Sphingomorpha aliena,** new species

Plate XIII, Figure 14, ♂

♂. In the outline of the primaries this species agrees with *S. chlorea*, the type of the genus, the outer margins being evenly rounded and not produced or slightly angulated at the extremity of vein 4, as is the case in *S. pudens*.

The prevalent color is reddish brown, moderately dark. The vertex and inner edges of the tegulæ are very pale warm gray, which color extends backward on the thorax between the patagia, and is continued as a pale dorsal line on the abdomen. The under side of the palpi, the pectus, the thorax, and the abdomen are pale fawn-color. The fore wings have a few minute dark basal points, a very fine, dark, outwardly curved subbasal line, a fine, dark, straight median line running obliquely from the middle of the costa to about the middle of the inner margin. At the end of the cell is a minute dark spot, surrounded by a few lighter scales. There is a trace of a faint postmedian line, only visible near the costa, and terminating about vein 5. Beyond this is a fine dark submarginal line running from the apex to the inner margin, slightly curved at its upper end, and terminating upon the inner margin at a point about one-fourth the length of this margin behind the inner angle of the wing. The hind wings on the upper side are similar in color to the fore wings, but a little darker in tone, except at the anal angle, where they become paler and are marked by three incomplete dark bands running inwardly towards the middle of the wing, before reaching which they become obsolete. The two lower bands are close to each other, but the one above them is separated by a wider interval than that which parts the two nearest the outer margin. There is a fine dark submarginal line, near the anal angle composed of very minute lunules, accentuated externally by lighter scales. The fringes are concolorous, and not checkered with lighter color. On the under side both wings are pale fawn, with the lower half of the cell and the inner margin of the primaries darker, the scales long and closely appressed on these areas. There are a few dark punctulations on the limbal area of both wings, and the dark incomplete bands seen on the upper side of the secondaries reappear on the lower side, but are fainter and shorter. Expanse, 50 mm.

The type is a quite perfect specimen in the Carnegie Museum taken at Banza Manteka by A. L. Bain, the paratype is a much less perfect specimen in the collection brought back by the Lang-Chapin Expedition, and belongs to The American Museum of Natural History. This latter specimen is labelled "Medje, VII, 6, 1910."

ABURINA Mœschler

(583) 1. **Aburina infirma** (Holland)

Naxia infirma HOLLAND, 1894, Psyche, VII, p. 52, Pl. III, fig. 5.

A single specimen was caught at Avakubi, August 30, 1913.

My reference of this species to the genus *Naxia* was, at the time I made it, quite provisional. Hampson sinks *Naxia* Guenée as a synonym of *Parallelia* Hübner. The insect certainly does not fall into *Parallelia*, though it accorded, at the time I studied it, with a number of species which then (1892) were classified under *Naxia* in the British Museum. Upon the whole, I am inclined to regard it as perhaps best referred to Mœschler's genus *Aburina*, in which Sir George F. Hampson tells me he has placed it.

POLYDESMA Boisduval

(584) 1. **Polydesma umbricola** Boisduval

Polydesma umbricola BOISDUVAL, 1834, Faune Ent. Madagr., Lep., p. 108, Pl. XIII, fig. 5. HAMPSON, 1894, Moths of India, II, p. 468.

Three specimens, two taken at Medje in April 1910, one at Stanleyville, in the same month, 1915. A common insect in the tropics of the Eastern Hemisphere.

RHYNCHODES[1] Guenée

(585) 1. **Rhynchodes avakubi,** new species

Plate XIII, Figure 10, ♀

♀. Upper side of both wings moderately dark purplish brown; body on the upper side concolorous; the body and wings on the lower side a shade lighter; the fore wing is crossed by a fine dark median line, curving inwardly and running from about two-thirds of the length of the costa from the base downwardly to the middle of the inner margin, cutting diagonally across the end of the cell. Beyond this there is a heavy black, or dark brown line, which runs perpendicularly from a point on the costa a little before the apex to the inner margin, which it reaches about one millimeter beyond the inner angle of the wings. This band is accentuated both on the inner and outer sides by a few faint reddish scales; the fringes at the apex and in the excavated portion of the outer margin below the apex are dark brown. Expanse, 32 mm.

The type was taken at Avakubi on August 30, 1913, and is in The American Museum of Natural History. A paratype taken at Efulen, Cameroon, by Dr. H. L. Weber, is in the Carnegie Museum.

AMPHIGONIA Guenée

(586) 1. **Amphigonia complex** (Holland)

Episparis complex HOLLAND, 1894, Psyche, VII, p. 103, Pl. IV, fig. 14.

Two examples taken at Matadi, June 24, 1909, agree with the type.

---

[1] There is another species of this genus known to the writer, which apparently has not been described and which he takes the present opportunity to diagnose.

Rhynchodes efulensis, new species

♂, ♀. Resembling *R. avakubi*, but differing in having the ground-color on the upper side bright castaneous; in the males the median line in the three specimens before me is almost obsolete upon the fore wings; in the two females representing the species it is visible, but very fine, and differs from the median line in *R. avakubi* in not being curved inwardly, but running more nearly vertically from the middle of the costa to the middle of the inner margin. The outer line crossing the wing in the males is heavier and darker than in *R. avakubi*; on the under side of the fore wings the costa is bright orange with the cell at its end and the region immediately beyond the cell clouded with dark fuscous; the inner margin of the fore wing on the lower side inclines to whitish. The lower side of the hind wing is orange-red and there is a prominent black spot at the end of the cell of the hind wing on the lower side. Expanse, 25–30mm. Types in Carnegie Museum. Several paratypes. Habitat Cameroon.

Closely related to *avakubi*, but easily distinguished by the brighter color and the orange costa of the under side of the fore wing.

(587) 2. **Amphigonia simplex** (Holland)

Episparis simplex HOLLAND, 1894, Psyche, VII, p. 104, Pl. IV, fig. 11.

One badly damaged specimen taken at Medje, July 6, 1910. It agrees with the type, with which it has been compared.

(588) 3. **Amphigonia costalis** Walker

Amphigonia costalis WALKER, 1865, List Lep. Het. B. M., XXXIII, p. 1031.

Four specimens agree absolutely with others in the Holland Collection which were compared in 1892 with Walker's type and found to be his species. The examples were all taken at Medje from June to August.

(589) 4. **Amphigonia hyalinata,** new species

Plate XIII, Figure 11, ♂

♂. Antennæ testaceous; eyes black; vertex, frons, and palpi pale reddish brown; tegulæ, patagia, and upper side of thorax darker reddish brown; upper side of abdomen paler than thorax, and inclining to ashen gray; at the union of the thorax and abdomen on the upper side of the first segment of the latter a number of whitish hairs, presenting the appearance of a lighter colored annulus. Pectus, lower side of thorax, and abdomen pale fawn-color, almost white in certain lights; legs fawn-colored externally, white internally, the tibiæ of the fore legs marked inwardly with two deep black linear spots. Fore wing on the upper side reddish brown from the base to about the middle, on the outer third plumbeous; crossed by fine transverse lines as follows: a basal outwardly curved line; an irregularly curved median line running obliquely from the inner margin to the end of the cell, which it does not surpass, but in which it displays a retrorse hook-like prolongation; two parallel irregularly curved and crenulate postmedian lines. The space beyond the outermost of these lines to the margin is uniformly moderately dark plumbeous. On the costa there are five small light spots, the one near the base minute and circular, the remaining four linear. The most conspicuous marking of the fore wing is a large trapezoidal pale yellowish translucent spot beyond the end of the cell, its longer outline on the costa, the parallel side resting on vein 4. The hind wing on the upper side is of the same color and shade as the fore wing. There is a small discal dark dot near the end of the cell, and the two parallel curved postmedian lines of the fore wing are continued on the hind wing, sweeping in a rather even curve to the inner margin, being only inangulated on vein 3. On the under side both wings are pale yellowish white at the base, gradually becoming suffused outwardly with brown, which is deepest at the margins. Opposite the cell on the outer margin of the primary is a dark lunulate spot of deeper brown, and the outermost of the two postmedian dark lines of this wing is reproduced on the lower side by a regularly curved series of blackish spots on the interspaces. On the under side of the hind wing the discal spot is reproduced and the two postmedian bands of the upper surface reappear, being represented by two rows of small dark spots on the interspaces, which are wider apart than the lines on the upper surface. Expanse, 42 mm.

The type, which is unique, was captured at Stanleyville, August 6, 1909, and is deposited in The American Museum of Natural History.

Erastriinæ

Amyna Guenée

(590) 1. **Amyna punctum** (Fabricius)

Noctua punctum Fabricius, 1794, Ent. Syst., III, part 2, p. 47.

(For the voluminous synonymy see Hampson, Cat. Lep., Phal., X, 1910, p. 472.)

Two specimens which I take to be a variety of this species were taken at Stanleyville, April 9, 1915.

The species is variable and the specimens appear to represent one of its protean forms. The whole genus is in more or less of a "mess." Hampson has straightened things out to some extent, but there remains more to be done. According to Hampson *A. punctum* has had no less than eleven specific names applied to it, and *A. octo* is blessed with twenty specific names and has been located in no less than twelve genera.

Ozarba Walker

(591) 1. **Ozarba** species (?)

A single, somewhat damaged specimen, which I am unable to refer to any species which thus far has been described and figured, but which I do not wish to name without more and better material, was caught at Banana, June 21, 1909.

Heterospila Guenée

(592) 1. **Heterospila** (?) **rubida,** new species

Plate XIII, Figure 12, ♂

♂. Antennæ two-thirds length of fore wing, feebly pectinate except at tip, which is simple. Palpi porrect, third joint minute. Eyes moderately large, black; head and upper side of thorax bright orange-red; upper side of abdomen pale fuscous; tibiæ, which are heavily clothed with hair, orange-red; tarsi fuscous, annulated with white. Both wings on the upper side prevalently purplish red, variegated with bright red and pale yellowish spots. The costa of the fore wing is red with three dark transverse spots near the base; the inner half of the wing is reddish, crossed by a dark subbasal and a dark median band, which are parallel to each other; the reniform is dark, pupilled with light red, and the space before and after it is lighter, in the type yellowish, in the paratype pale reddish; the outer half of the fore wing is clouded with purplish brown, interrupted on the interspaces by an irregularly curved row of submarginal spots, which are yellowish in the type, and pale reddish in the paratype. The hind wing on the upper side is prevalently reddish purple, paler toward the base, and crossed by obscure median and postmedian dark lines, and marked in the region of the anal angle with scattered pale reddish spots. On the under side the wings are pale yellowish shading into fuscous externally. There is a small dark dot in the cell of the fore wing, followed by a larger dark spot at its end; a similar spot occurs at the end of the cell of the hind wing. Both wings are crossed from their costæ to near their inner margins by similarly curved parallel postmedian and submarginal bands composed of dark spots upon the interspaces. Expanse, 34 mm.

The collection contains two specimens: the type, taken at Medje, April 6, 1910, which is in The American Museum of Natural History; and the paratype, a ragged specimen, taken at Avakubi, August 30, 1913, which is in the Holland Collection in the Carnegie Museum.

The species is strictly congeneric with the insect to which I provisionally gave the name *Heterospila (?) calescens* (see Psyche, 1894, VII, p. 177, Pl. v, fig. 13). The generic reference is open to question, as I well know, and it is almost certain to my mind that a new genus will ultimately have to be erected for the reception of the species, but as Sir George F. Hampson is at present working up the insects of this group, I do not now feel called upon to do more than I have here done.

Hypeninæ

SIMPLICIA Guenée

(593) 1. **Simplicia** (?) species (?)

A single specimen taken at Bolengi, August 20, 1909, which seems to come into this genus but which I have been unable to determine upon comparison with the literature and which I do not wish to venture to describe as new, though it probably is nondescript. We have a number of species which belong to this genus, but, until there is an opportunity to study them more closely and compare with the material upon which others are at present working, it would be unwise to attempt to describe them.

ELYRA Walker

(594) 1. **Elyra** (?) **gabunalis** Holland

Elyra (?) *gabunalis* HOLLAND, 1894, Psyche, VII, p. 126, Pl. IV, fig. 17.

A rubbed and defective specimen of this insect was taken at Medje, June 26, 1910. I referred the species to Walker's genus *Elyra* at the time I described it, but this reference is merely provisional and based upon the fact that the insect seems to be congeneric with the African species to which Walker applied the name *Elyra* (?) *cachrusalis* (cf. Walker, List Lep. Het. B. M., XVI, p. 204). I think a new genus will have to be erected for the reception of this insect, as to my mind it is not congeneric with the Bornean insect *Elyra phlegeusalis*, which is the type of the genus. There is a very marked difference in the structure of the palpi, etc., between *E. phlegeusalis*, and the two African species.

Hypena Schrank

(595) 1. **Hypena** species (?)

A single specimen, in rather poor condition, which I am unable to refer to any species at present known to me but which I hesitate to describe without better material was taken at Medje, August 5, 1910.

Deinypena Holland

The genus *Deinypena*, the type of which is *D. lacista* Holland, is divisible into two sections. The first is represented by *D. lacista* Holland, *D. lathetica* Holland, and *D. margine-punctata* Holland, in which the antennæ of the males are heavily pectinate almost to the tip, the antennæ of the females being simple. The second section is composed of the species *geometroides* Holland, *apicata* Hampson, and the species described in the following paragraphs in which the antennæ of the males are less heavily pectinated for three-quarters of their length, the setæ being shorter and curving downwardly and inwardly, the antennæ of the females being simple. In the neuration of the wings there is no great difference; the palpi are remarkably long, in the first section the third joint being more heavily clothed with hair than in the second section. I have not seen *Deinypena triangularis* Bethune-Baker, and cannot, therefore, determine into which of the two sections of the genus that species falls.

(596) 1. **Deinypena morosa,** new species

Plate XIII, Figure 18, ♂

♂. Head, palpi, upper side of thorax and abdomen obscure chocolate-brown; fore wings and hind wings chocolate-brown, darker at the base and slightly illuminated on the outer half by a purplish iridescence; crossed by an irregularly curved median dark line, followed immediately by a parallel postmedian line, both of these lines curving backward basad near the costa; an obscure light point in the middle of the cell, and an obscure reniform at the end of the cell outlined by light scales; there is a submarginal series of fine white points extending from the apex to the inner margin; the margins are defined by a very fine black line, accentuated inwardly by minute white lines on the interspaces; the fringes are uniformly dark, not checkered. On the under side the wings are pale brown; the legs and the under side of the body concolorous; the fore wing is crossed by a dark vertical antemedian line, a median line, angulated at the end of the cell, and by a pale submarginal line which runs from the apex somewhat diagonally toward the inner margin, which it does not quite reach. The apex broadly whitish. The hind wing is crossed by three dark curved bands: a median band crossing the end of the cell, a postmedian band, and a broader submarginal band, all three of which are somewhat diffuse. Expanse, 45–50 mm.

The type, which was taken at Medje on July 17, 1910, is in The American Museum of Natural History. The paratype, which was taken at Gamangui on June 18, 1910, is in the Holland Collection in the Carnegie Museum.

(597) 1*a*. **Deinypena morosa pallidior**, new variety

♂. There is a specimen which I am inclined to regard as merely a variety of the foregoing species. It differs in being very much paler on the upper surface of both the fore and hind wings and in having the parallel transverse lines which cross both wings more distinctly defined.

This insect may represent a different species, but I do not think it is more than a variety of the foregoing. It was taken at Ukaturaka on July 24, 1909 and is in The American Museum of Natural History.

(598) 2. **Deinypena fulvida,** new species

Plate XIII, Figure 16, ♂

♂. Allied to the foregoing species; the upper side of the thorax and abdomen pale fawn; palpi and antennæ dark brown; fore wings fawn; obscure traces of a pale reniform at end of cell; very faint postmedian crenulated fine darker line bent backward basad from vein 6 to costa; on the costa marked just before the apex by a dark brown shade, darkest externally; a series of submarginal sagittate points extending from vein 5 to the inner margin, gradually increasing in size, deepening in intensity of color. Hind wings with the basal third delimited from the outer two-thirds by a dark narrow line between which and the base the wing is deeper reddish brown; beyond this delimiting line the outer two-thirds of the wing is pale purplish fawn, traversed externally by a submarginal series of dark spots, increasing in size and intensity from the region of the costa toward the inner margin, which they reach a little above the angle. Both wings have a fine dark brown marginal line; fringes darker brown. On the under side both wings are pale reddish fulvous, crossed by a curved postmedian dark line, which does not quite reach the inner margins. Apex of fore wing broadly white with traces of a faint light submarginal line extending from the white space as far as vein 3; fringes on the under side, except at the apex, dark brown. Expanse, 47 mm.

The type is unique and is in The American Museum of Natural History. It was taken at Medje, June 30, 1910.

(599) 3. **Deinypena multilineata,** new species

Plate XIV, Figure 5, ♂

♂. Palpi on the upper side dark brown; head, upper side of thorax hoary gray; upper side of abdomen pale fawn; lower side of thorax and abdomen pale fuscous ochraceous; legs somewhat darker; the prevalent color of both the fore and the hind wings is grayish fawn, tending to fuscous toward the external margins. The fore wing has a pale grayish spot in the middle of the cell, accentuated externally by a minute black dot; reniform obscure, suborbicular; above it on the costa a dark shade. The fore wing is traversed by an irregularly curved dark subbasal line, festooned just below the costa and on vein 1. There is a dark median line which runs from the dark shade on the costa above the reniform outwardly to beyond the cell on vein 5, and then returns diagonally across the wing toward the inner margin, which it reaches about 2 mm. beyond the subbasal line. This median line is followed by a very fine subparallel postmedian line, sharply crenulate, or produced on the veins. Beyond the postmedian line there is a very dark subapical brown shade and a submarginal series of minute white points located on the veins and accentuated both externally and internally by dark black scales. There is a fine marginal dark line accentuated internally and on the interspaces with fine white lines. The fringes are dark brown, becoming blackish externally. Upon the hind wings the subbasal and median lines of the fore wing are continued as fine dark subparallel lines. The postmedian line of the fore wing is not continued upon the hind wing; the submarginal series of light spots accentuated inwardly and outwardly by dark brown scales is continued from the fore wing upon the hind wing, becoming most prominent toward the inner margin; the outer marginal line and the fringes of the hind wing are as on the fore wing. On the under side both wings are pale reddish ochraceous, with the submarginal and median lines of the upper side reproduced, but broader and more diffuse. The apex of the fore wing is broadly whitish and there is a faint pale submarginal band extending from this light patch toward the inner margin, which it does not quite reach. The submarginal series of spots found on the upper side of the hind wing on the lower side is represented by a broad diffuse band of blackish sagittate spots, fusing into each other and defined externally by paler sagittate markings. The fringes on the lower side are very dark brown or black. Expanse, 48 mm.

The type is unique and is in The American Museum of Natural History. It was taken at Medje, August 5, 1910.

(600) 4. **Deinypena transversata**, new species

Plate XIII, Figure 17, ♂

♂. Upper side of thorax, abdomen and wings moderately dark fawn to plumbeous; traces of a fine externally rounded subbasal line, a faint lighter-colored discal spot in the cell of the fore wing, and traces of a larger reniform spot at the end; a dark postmedian line runs outwardly from a little beyond the middle of the costa as far as vein 6, and then returns abruptly and runs in a straight line backward continuously toward the inner margin of the hind wing, which it does not quite reach; this line is sharply defined externally, but is diffuse internally. There are traces of a submarginal waved line near the tornus of the fore wing, and this is continued more distinctly upon the hind wing, being accentuated externally by some minute pale light spots; the margin in both wings is defined by a very fine brown line punctated on the interspaces by minute paler dots; the fringes are uniformly dark brown. On the under side the fore wings are whitish at the apex, and light testaceous on the inner margin. The fore wings are crossed by a median, postmedian, and submarginal dark band running from the costa as far as vein 1, the outer band being somewhat diffuse and broadest just before the apex; these three transverse bands are continued upon the secondaries as curved bands, the outermost being produced upon the nervules and accentuated by paler spots on the interspaces; the fringes on the under side are not much darker than the body of the wing. The female is marked much as the male, but there is some variation,—in one female the dark line on the upper side of the secondaries being succeeded outwardly by a band of pale sagittate spots forming a submarginal series. Expanse, male, 42–48 mm.; female, 38–50 mm.

The foregoing description is based upon a single defective specimen brought home by the Lang-Chapin Expedition, and four males and six females in the Holland Collection, collected by the late Dr. A. C. Good at Kangvé. The insect has long been standing in the cabinet awaiting description, and I avail myself of the present opportunity to give it a name. The type is a well-preserved male specimen contained in the Holland Collection, taken at Kangvé, on the Ogové River. The paratype is a somewhat defective specimen, taken at Medje on April 6, 1910, and is in The American Museum of Natural History.

(601) 5. **Deinypena obscura**, new species

Plate XIV, Figure 11, ♂

♂. General color of the upper surface pale wood-brown, the under side lighter; the fore wings near the base clouded with darker brown; two small black spots succeed each other in the cell and are followed by an obscure reniform, which is lost in a dark brown oblique median shade which runs from the costa to the inner margin and is succeeded externally by a finely waved somewhat irregular denticulate dark band; the apex and the tornus are clouded with dark brown; the outer margin is defined by a very fine brown line within which on the interspaces run fine transverse brown lines, darker than the rest of the wing. The fringes are dark brown, not checkered. The dark transverse brown shade of the fore wing is continued across the cell of the secondaries, and beyond toward the anal angle are a few fine black denticulate lines; the termen is darker than the rest of the wing, especially near the upper angle; on the lower side the costal area of the wing is lighter than the rest of the wing; there is a minute black dot in the middle of the cell and at the end of the cell a whitish point accentuated before and behind by black scales, followed by a faint postmedian dark denticulate line; near the apex the fore wing is somewhat lighter than the rest of the wing and is marked with minute striæ. The hind wing is somewhat paler than the fore wing, is crossed by an obscure median band running from about the middle of the costa toward the inner margin, succeeded by a fine denticulate postmedian line succeeded by a submarginal light line defined externally and internally by deeper brown lines; the termen is slightly darker than the rest of the wing. Expanse, 45–48 mm.

The type was taken at Medje, July 6, 1910, and is in The American Museum of Natural History. The paratype was taken at Medje, on July 17, and is in the Holland Collection in the Carnegie Museum.

The foregoing enumeration of the Noctuids brought home by the American Museum Congo Expedition takes no account of a small residuum consisting of eight or nine specimens thoroughly denuded of scales, lacking antennæ and legs, and otherwise imperfect. Any attempt to classify them would be useless. They represent at least six additional species, to determine which would be a labor worthy of a paleontologist, but hardly commendable in the case of an entomologist, who may expect at any time to obtain perfect material for study.

Lymantriidæ

STILPNOTIA Westwood and Humphreys

(602) 1. **Stilpnotia ogovensis** (Holland)

Redoa ogovensis HOLLAND, 1893, Ent. News, IV, p. 63, Pl. III, figs. 12, 13.
Leucoma nitida SWINHOE, 1903, Trans. Ent. Soc. London, LI, p. 379.

Two males and one female taken at Medje in June and July. The description of *L. nitida* Swinhoe shows plainly that it is based upon specimens which have the characteristics which caused me to separate the species from *luteipes* Walker, namely "fore wings with a beautiful silvery sheen, with thin longitudinal curved waves in certain lights, etc." The specimens have been compared with the types in my collection, with which they agree absolutely; the specimen in the Druce Collection of which Swinhoe speaks was a male of *S. luteipes* inadvertently sent Druce as *R. ogovensis*, the males of the two species having been carelessly mixed.

NAROMA Walker

(603) 1. **Naroma signifera** Walker

Naroma signifera WALKER, 1856, List Lep. Het. B. M., VII, p. 1744.

One badly worn female specimen taken at Niangara, December 9, 1910. The *signa*, consisting of a circlet of black raised scales in the cell of the fore wing, are rubbed off in the specimen, but traces of them may be seen with a glass.

STRACENA Swinhoe

(604) 1. **Stracena** species (?)

A single worn specimen allied to the species to which I applied the name *promelæna* but not identical with it, as shown by the type, nor with *fuscivena* Swinhoe, of which we have good specimens. The specimen is, however, too poor to permit me to found a new species upon it. It was taken at Medje in July.

SAPELIA Swinhoe

(605) 1. **Sapelia bipunctata,** new species

Plate XIV: Figure 3, ♂; Figure 4, ♀

♂. White throughout, except that the frons, the pectus and the legs are yellowish, and that at the end of the cell of the primaries there are two minute black dots, one at the upper and the other at the lower outer angle. In one or two specimens these spots are quite indistinct, and in others they are quite conspicuous. In one or two specimens the costa of the fore wing at the base has a few dark scales.

♀. Like the male, but with greater expanse of wing, and with heavier body and reduced antennæ. Expanse, ♂, 38–42 mm.; ♀, 50–54 mm.

This insect runs to *Sapelia*, according to the table given by Aurivillius (1904, Arkiv Zool., II, part 4, p. 62), and I have no hesitation in locating it here, but I have not been able to find a description or figure in that or any allied genus which fits the species and therefore describe it as new. There are seven males and four females in the collection. They were all taken at Medje in June and July, except one male caught at Gamangui on February 17 and a female captured at Medje on April 6, 1910. The types are in The American Museum of Natural History; paratypes have been reserved for the Holland Collection in the Carnegie Museum.

OLAPA Walker

(606) 1. **Olapa flabellaria** (Fabricius)

Phalæna flabellaria FABRICIUS, 1787, Mantissa Ins., II, p. 188.
Liparis crocicollis HERRICH-SCHÆFFER, 1854, Aussereur. Schmett., fig. 110.
Olapa flabellaria SWINHOE, 1903, Trans. Ent. Soc. London, LI, p. 390.

There are two females in the collection, one caught at Pawa, October 20, 1910; the other taken at Faradje, December 11, 1912.

LEUCOPERINA[1] Aurivillius

(607) 1. **Leucoperina atroguttata** Aurivillius

Leucoperina atroguttata AURIVILLIUS, 1908, Arkiv Zool., V, part 5, p. 8.

There is a single male specimen of this interesting insect which agrees absolutely with the description of the genus and species given by its author. His description is founded upon a single male contained in the Museum at Brussels. There are two females in our collections, one in the Holland Collection from the valley of the Ogové, the other in the general collection from Cameroon, as well as a male in the Holland Collection. The female is much larger than the male, but in neuration and markings the two sexes agree exactly. The antennæ also, as might be predicated without any information, are less plumose and shorter in the female. Expanse, ♀, 47–52 mm.

---

[1] I cannot resist the opportunity to describe another species of this rare genus of insects to the existence of which my attention has been called by my assistant, Mr. Hugo Kahl.

Leucoperina kahli, new species

♂. Agreeing structurally in every particular with *L. atroguttata* Aurivillius, but differing in having the primaries pale uniformly semi-translucent fawn-colored, and the secondaries, which are white, clouded at the inner angle with pale brown. The wings are less diaphanous than is the case in *atroguttata*, the black mark on the fore wings at the origin of vein 2 is the same. Expanse, 38 mm. Cameroon. Type in Carnegie Museum.

The specimen in The American Museum of Natural History was taken at Medje, in the first week of September 1910.

MYLANTRIA Aurivillius

(608) 1. **Mylantria xanthospila** (Plœtz)

Anoa (?) xanthospila PLŒTZ, 1880, Stett. Ent. Zeit., XLI, p. 84.
Chærotriche orestes DRUCE, 1887, Proc. Zool. Soc. London, (1888), p. 674.
Nygmia orestes KIRBY, 1892, Cat. Lep. Het., p. 449.
Mylantria xanthospila AURIVILLIUS, 1904, Arkiv Zool., II, part 4, p. 54.

Aurivillius founds his genus *Mylantria*, of which this insect is the type, upon the fact that in it veins 6 and 7 of the hind wing are stalked, which is not the case in the genus *Lymantria*.

The species appears to be not uncommon, and we have more than one hundred specimens in our collections derived from many localities, most of them from Cameroon. It is represented in the collection upon which I am reporting by two males taken at Medje, one in July, the other in August.

DASYCHIRA Hübner

(609) 1. **Dasychira albicostata** (Holland)

Ilema albicostata HOLLAND, 1893, Psyche, VI, p. 471, Pl. XVII, fig. 5.

One rubbed specimen taken at Kwamouth, July 15, 1909.

(610) 2. **Dasychira muscosa** (Holland)

Notohyba muscosa HOLLAND, 1893, Psyche, VI, p. 453.

One more or less defaced specimen taken at Bafwabaka, January 7, 1910.

(611) 3. **Dasychira crucifera** (Holland)

Œcura (?) crucifera HOLLAND, 1893, Psyche, VI, p. 453, Pl. XVIII, fig. 15, *o*.

A ragged and rubbed female has been compared with the type and is undoubtedly the same. The insect was caught at Medje, July 29, 1910.

(612) 4. **Dasychira gnava** Swinhoe

Pseudonotodonta virescens MŒSCHLER, 1889, Abhandl. Senck. Nat. Ges., XV, p. 77, Pl. fig. 6. (*nom. præocc.*).
Dasychira gnava SWINHOE, 1903, Trans. Ent. Soc. London, LI, p. 477.

One male caught at Banalia, September 22, 1914.

LÆLIA Stephens

(613) 1. **Lælia lignicolor** Holland

Lælia lignicolor HOLLAND, 1893, Psyche, VI. p. 431, Pl. x, fig. 17.

One specimen taken "near Nouvelle Anvers, VII, 23, 1909." The insect, upon comparison with the type, is found to agree perfectly.

(614) 2. **Lælia hildoides,** new species

♂. Eyes deep black; palpi brown edged below with white; antennæ with culmen white, setæ testaceous; frons brown, edged on either side, near the eyes, with a narrow whitish line; tegulæ rosy fawn, edged inwardly with brown, so as to cause the brown shade of the upper side of the head to appear to be produced backwardly as a short dark shade; patagia and upper side of thorax rosy fawn; upper side of abdomen pale fawn; pectus whitish with a few brownish hairs below; lower side of thorax and abdomen whitish; legs white, except that the anterior pair are inwardly dark brown. The fore wings on the upper side are prevalently rosy fawn; at the base there are two or three very minute dark punctulations; a dark brown transverse diagonal line, defined outwardly by white, runs from the costa a little before its middle and reaches the inner margin a little more than the fourth of its length before the base; the position of the reniform is indicated by a few light scales, and there is a short dark bar at the end of the cell, defined outwardly by a narrow whitish line. From a point a little before the apex there runs a dark rather heavy postmedian line, terminating upon the inner margin at its middle, and sharply defined outwardly by a narrow band of pure white. A regularly outwardly curved submarginal line, composed of dark spots defined externally with white, runs from the same point where the postmedian line originates upon the costa, parallel to the outer margin, and reaches the inner margin about three-fourths of its length from the base. The hind wings on the upper side are pale, almost white, creamy at the base, deepening into very pale fawn externally, with minute dark punctulations at the end of the veins on the margins. On the under side both wings are creamy white, the fore wing towards the apex and the hind wing on the costal half marked by minute pale striæ and punctulations. The postmedian line on the fore wing reappears faintly on the lower side and on the same side of the secondaries there is an imperfect transverse narrow submarginal line, running from the costa as far as vein 4. There is also a faint reproduction of the bar with which the end of the cell of the primaries is closed on the upper side, this being represented on the lower side by a few dark scales.

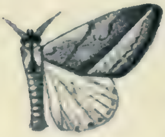


Fig. 5.
Lælia hildoides Holland
♂. 1/1.

♀. The female does not differ, except in its sexual characteristics, from the male, the size being greater, however, and the wings broader. The markings both of the upper and lower sides are very much the same. Expanse, ♂, 22–35 mm.; ♀, 35–40 mm.

The foregoing description is founded upon fourteen males in the collection in the Carnegie Museum, and three females, from the French Congo and Cameroon, including the female specimen brought back by the American Museum Congo Expedition from Medje.

This insect, which in coloration agrees with the insect which I named *Heteronygmia clathrata* (see Psyche, 1893, VI, p. 415), recalls in the markings of the fore wings the limacodid which bears the name *Ctenocompa hilda* (Druce). It is represented in the collection by a mashed female specimen, taken at Medje in the first week of September 1910. We have good examples taken at Efulen, Cameroon, and I select a finely preserved male from our collection as the type of that sex and designate the damaged female in the Lang-Chapin Collection, as well as a series of males and females in the Carnegie Museum as paratypes.

(615) 3. **Lælia soloides,** new species

Plate XIV, Figure 7, ♀

♀. Structurally the insect runs to *Lælia* according to the analytical table given by Aurivillius, 1904, Arkiv Zool., II, No. 4, pp. 62 *et seq.*, but in the color and markings of the wings it looks exactly like some species of the genus *Soloë*. The head, thorax, and abdomen are more or less clothed with yellowish hairs; the legs are yellowish; there are two rows of black spots on the under side of the abdomen; both the fore and hind wings are white, the former slightly dusted on the costa and apical area with pale gray; both wings have at the end of the cell moderately large and very conspicuous roundish black discal spots. Expanse, 44 mm.

The type, which is unique and not in very fine condition, was taken at Medje about the middle of August 1910 and is in The American Museum of Natural History.

(616) 4. **Lælia** species (?)

One specimen taken at Faradje, April 1911, which represents a species probably new to science, but the example is in too imperfect a condition to justify its description.

Sphingidæ

HERSE Oken

(617) 1. **Herse convolvuli** (Linnæus)

Sphinx convolvuli LINNÆUS, 1758, Syst. Nat., 10th Ed., p. 490.

Protoparce convolvuli REBEL, 1910, in Berge's Schmett., 9th Ed., p. 91, Pl. XVII, figs. 3*a*, *b*, *c*.

Herse convolvuli ROTHSCHILD AND JORDAN, 1903, Nov. Zool., IX, Suppl., part 1, p. 11.

Of this common and widely distributed species there are three examples, a male and two females, all taken at Faradje in November 1910.

ACHERONTIA Laspeyres

(618) 1. **Acherontia atropos** (Linnæus)

Sphinx atropos LINNÆUS, 1758, Syst. Nat., 10th Ed., p. 490.
Acherontia atropos REBEL, 1910, in Berge's Schmett., 9th Ed., p. 87, Pl. XVII, figs. 1*a*, *b*, *c*.

Four males, three caught at Medje in August, and one captured at Faradje "1911–1912."

CŒLONIA Rothschild and Jordan

(619) 1. **Cœlonia fulvinotata** (Butler)

Protoparce fulvinotata BUTLER, 1875, Proc. Zool. Soc. London, p. 11.
Cœlonia fulvinotata ROTHSCHILD AND JORDAN, 1903, Nov. Zool., IX, Suppl., part 1, p. 25.

One male caught at Niangara, April 14, 1913.

POLYPTYCHUS Hübner

(620) 1. **Polyptychus orthographus** Rothschild and Jordan

Polyptychus orthographus ROTHSCHILD AND JORDAN, 1903, Nov. Zool., IX, Suppl., part 1, p. 244, Pl. I, fig. 9, ♂.

One example was taken at Medje.

(621) 2. **Polyptychus nigriplaga** Rothschild and Jordan

Polyptychus nigriplaga ROTHSCHILD AND JORDAN, 1903, Nov. Zool., IX, Suppl., part 1. p. 259, Pl. V, fig. 4, ♂.

One male taken at Medje, August 15, 1910.

LIBYOCLANIS Rothschild and Jordan

(622) 1. **Libyoclanis hollandi** Clark

Libyoclanis hollandi CLARK, 1917, Proc. New Eng. Zool. Club, VI, p. 62, Pl. VII, fig. 3, ♀.

The single female captured at Medje constitutes the type of the species and was described by Mr. Clark before the writer of this paper began his task.

NEPHELE Hübner

(623) 1. **Nephele comma** Hopffer

Nephele comma HOPFFER, 1857, Monatsber. Akad. Wiss. Berlin, p. 421; 1862, Peters, Reise n. Mossambique, Zool., V, p. 424, Pl. XXVII, fig. 12.

Two poorly preserved males, taken at Faradje, December 5 and 13, 1912.

(624) 2. **Nephele funebris** (Fabricius)

Sphinx funebris FABRICIUS, 1793, Ent. Syst., III, part 1, p. 371.

Nephele funebris funebris ROTHSCHILD AND JORDAN, 1903, Nov. Zool., IX, Suppl., part 1, p. 557.

One male labelled as taken at Stanleyville, April 8, 1915.

(625) 2*a*. **Nephele funebris maculosa** Rothschild and Jordan

Nephele funebris maculosa ROTHSCHILD AND JORDAN, 1903, Nov. Zool., IX, Suppl., part 1, p. 558.

Of this varietal form there are eight male specimens; one taken at Matadi, June 24, 1909; two captured at Ngayu, March 1910; five from Stanleyville, two caught in February and two in March, and one in April 1915.

(626) 3. **Nephele bipartita** Butler

Nephele bipartita BUTLER, 1878, Ann. Mag. Nat. Hist., (5) II, p. 455.

One male from Matadi, caught June 24, 1909.

(627) 4. **Nephele peneus** (Cramer)

Sphinx peneus CRAMER, 1776, Pap. Exot., I, p. 139, Pl. LXXXVIII, fig. *D*.

Nephele peneus peneus ROTHSCHILD AND JORDAN, 1903, Nov. Zool., IX, Suppl., part 1, p. 560.

One female captured at Medje in July 1910.

(628) 5. **Nephele accentifera** (Palisot de Beauvois)

Sphinx accentifera PALISOT DE BEAUVOIS, 1805, Ins. Rec. en Afrique et Amérique, Lép., p. 264, Pl. XXIV, fig. 1.

Nephele accentifera ROTHSCHILD AND JORDAN, 1903, Nov. Zool., IX, Suppl., part 1, p. 560.

Two females: one from Medje, July 8, 1910; the other taken at Faradje, December 13, 1912.

TEMNORA Hübner

(629) 1. **Temnora fumosa** (Walker)

Zonilia fumosa WALKER, 1856, List Lep. Het. B. M., VIII, p. 193.

Temnora fumosa ROTHSCHILD AND JORDAN, 1903, Nov. Zool., IX, Suppl., part 1, p. 574, Pl. XIII, fig. 5, ♂.

Two males, one from Gamangui, February 8, the other from Medje, March 19, 1910.

(630) 2. **Temnora** species (?)

There is a remnant of a specimen taken at Poko, August 19, 1913, which comes near *T. eranga* Holland but is evidently different and probably represents an undescribed species, but the insect, or what is left of it, is in too dilapidated a condition to justify the attempt to describe it.

Atemnora Rothschild and Jordan

(631) 1. **Atemnora westermanni** (Boisduval)

Macroglossa westermannii Boisduval, 1875, Spec. Gén. Lép. Hét., I, p. 355.
Atemnora westermanni Rothschild and Jordan, 1903, Nov. Zool., IX, Suppl., part 1, p. 616.

Three specimens in rather poor condition, all taken at Medje, one in March, one in July, and one in August.

Euchloron Boisduval

(632) 1. **Euchloron megæra** (Linnæus)

Sphinx megæra Linnæus, 1758, Syst. Nat., 10th Ed., p. 492. Clerck, 1764, Icones Ins., II, Pl. xlvii, fig. 2.
Euchloron megæra megæra Rothschild and Jordan, 1903, Nov. Zool., IX, Suppl., part 1, p. 743.

Two males and two females in not very fine condition taken at Medje , a pair in August, a second male in September, and a female without date.

Basiothia Walker

(633) 1. **Basiothia charis** (Boisduval)

Chærocampa charis Boisduval, 1847, Delegorgue, Voy. Afr. Australe, p. 595.
Basiothia charis Rothschild and Jordan, 1903, Nov. Zool., IX, Suppl., part 1, p. 746.

One male caught at Faradje, December 5, 1912.

Hippotion Hübner

(634) 1. **Hippotion osiris** (Dalman)

Deilephila osiris Dalman, 1823, Anal. Ent., p. 48.
Hippotion osiris Rothschild and Jordan, 1903, Nov. Zool., IX, Suppl., part 1, p. 750.

There are eleven specimens. One was taken at Avakubi "1909"; one at Bafwasende, September 25, 1909; one at Medje, March 1910; eight at Faradje in November and December 1912.

(635) 2. **Hippotion celerio** (Linnæus)

Sphinx celerio Linnæus, 1758, Syst. Nat., 10th Ed., p. 491.
Hippotion celerio Rothschild and Jordan, 1903, Nov. Zool., IX, Suppl., part 1, p. 751.
Chærocampa celerio Rebel, 1910, in Berge's Schmett., 9th Ed., p. 97, Pl. xix, fig. 6

The collection contains three specimens caught at Faradje, one in November, and two in December 1912; there is also a specimen labelled "on board S. S. Leopoldville, off coast of Senegal, June 10, 1909."

(636) 3. **Hippotion eson** (Cramer)

Sphinx eson CRAMER, 1779, Pap. Exot., III, p. 57, Pl. CCVI, fig. *C*.
Hippotion eson ROTHSCHILD AND JORDAN, 1903, Nov. Zool., IX, Suppl., part 1, p. 754.

There are twenty-nine specimens, most of which were taken at Faradje in November and December 1912; two are recorded as from Medje, one caught in July, the other in August; one is from Niangara, June 14, 1913, and one is from Avakubi, August 20, 1913.

(637) 4. **Hippotion balsaminæ** (Walker)

Chærocampa balsaminæ WALKER, 1856, List Lep. Het. B. M., VIII, p. 138.
Hippotion balsaminæ ROTHSCHILD AND JORDAN, 1903, Nov. Zool., IX, Suppl., part 1, p. 579.

Twelve examples, all captured at Faradje in November and December 1912, except one which was taken at Avakubi, October 20, 1909.

CENTROCTENA Rothschild and Jordan

(638) 1. **Centroctena rutherfordi** (Druce)

Panacra rutherfordi DRUCE, 1882, Ent. Mo. Mag., XIX, p. 16.
Centroctena rutherfordi ROTHSCHILD AND JORDAN, 1903, Nov. Zool., IX, Suppl., part 1, p. 790, Pl. x, fig. 9, ♀.

There are two examples, one taken at Medje in July 1910 and the other at Panga, September 18, 1914.

Striphnopterygidæ

JANA Walker

(639) 1. **Jana eurymas** Herrich-Schæffer

Jana eurymas HERRICH-SCHÆFFER, 1854, Aussereur. Schmett., Pl. XXI, fig. 98. AURIVILLIUS, 1901, Bihang Kongl. Sv. Vet.-Akad. Handl., XXVII, Afd. IV, No. 7, p. 24.

There are four males ranging in expanse of wings from 80–105 mm. Three were taken at Medje in July and August 1910, and one at Isiro, in July 1913.

(640) 2. **Jana camerunica** Aurivillius

Jana camerunica AURIVILLIUS, 1893, Ent. Tidskr., XIV, p. 206; 1901, Bihang Kongl. Sv. Vet.-Akad. Handl., XXVII, Afd. IV, No. 7, p. 23.

The collection contains one male and two females, all in poor condition, being more or less torn and rubbed. One of the males was taken at Avakubi, October 18,1909, the other at Medje in July 1910, the female was captured at Avakubi, May 27, 1914. The specimens from Avakubi are remarkably large, the male having an expanse of 150 mm. or six inches, the female expanding 160 mm. or six and three-eighths of an inch.

I cannot follow Aurivillius, who with a query sinks *J. nobilis* Holland as a synonym of this species. His description of *J. camerunica* is founded upon a specimen which was in the collection of the late Dr. Otto Staudinger. I had the opportunity of comparing it with the insect to which I gave the specific name *nobilis,* at that time noting that it seemed to be different. *J. nobilis,* though one of the larger species of the genus found in Africa, is smaller than *J. camerunica* Aurivillius, has no trace of roseate or buff on the wings but is a cold gray, with darker brown and black markings arranged very much like those in *J. strigina* and, moreover, has the striking difference from the other species named in this note that the abdomen is annulated with black at the upper end of each segment. This seems to be a characteristic which, taken in connection with the totally different shade of color of the wings, seems to mark it as a form distinct from *J. strigina* and *J. camerunica.*

(641) 3. **Jana gabunica** Aurivillius

Jana gabunica Aurivillius, 1892, Ent. Tidskr., XIII, p. 195; 1901, Bihang Kongl. Sv. Vet.-Akad. Handl., XXVII, Afd. IV, No. 7, p. 24.

Jana marmorata Holland, 1893, Psyche, VI, p. 346, Pl. xx, fig. 2.

Three males: two taken at Medje, one in August, the other in September; the third specimen captured at Bafwasende in September 1909.

PHASICNECUS Butler

(642) 1. **Phasicnecus grandiplaga,** new species

Plate XIV, Figure, 14, ♂

♂. Antennæ whitish, the pectinations fuscous; eyes pale brown; pectus and the anterior pair of legs dark brown; the two posterior pairs of legs and the lower side of the thorax yellowish white. The vertex is pale stramineous; the patagia are bordered externally with stramineous, inwardly are dark maroon, as is also the top of the thorax; the abdomen is pale gray inclining to buff, especially on the lower side where there is at the middle a longitudinal row of four small dark spots. The ground-color of the fore wing on the upper side is pale stramineous, passing outwardly toward the margin into pale ashen gray. The fringes are concolorous. The wing is traversed by a basal, a subbasal, a median, a postmedian, and a submarginal dark line, which are most clearly defined on the light area along the inner margin, but are lost or more or less obscured on the darker median and costal areas of the wing. The postmedian and submarginal lines are exceedingly irregular, and respectively define outwardly and inwardly areas filled in with maroon colored scales, which form on the outer border below the apex a subtriangular spot with inwardly projecting lobes on the interspaces, joined by a narrow band of the same color to the larger area which covers the wing from above vein 2 to the costa, and as far marginad as the postmedian line, and which is also maroon of varying degrees of intensity, except at the end of the cell and just beyond it, where there is an irregularly defined patch of light yellowish scales. The hind wing is broadly pale stramineous in its upper half, shading into pale plumbeous on the outer border and the lower half; the fringes are concolorous. There is a faint median band composed of light reddish scales, which is regularly curved, external to which there is a similar but much darker postmedian band, which runs nearly in a straight line from the costa to a point on vein 2, where it turns abruptly inward and upward to the inner margin, terminating there in a small, but very dark brown spot, as does also the median transverse line. There is just above the anal angle a small dark linear spot, located on the inner margin between the anal angle and the dark spot which terminates the postmedian line at its inner extremity. On the lower side both wings are pale stramineous, the fore wing being clouded on the outer margin just below the apex with dark brown scales. The median and postmedian lines reappear on the lower side of the wings, the former being represented by a narrow brown line, the latter on the hind wing by a regular series of deep brown spots one on each interspace, but on the fore wing merely indicated by three similar spots near the costal margin, and one between veins 1 and 2. Expanse, 55 mm.

The type, which is unique, was taken at Medje, August 24, 1910, and is the property of The American Museum of Natural History.

When I first examined this specimen I had a feeling that somewhere or other I had seen a representation of the insect, but after a lengthy and painstaking search I have failed to verify my impression and am forced to the conclusion that it represents an undescribed species. It is nearest to *P. preussi* Aurivillius.

Notodontidæ

RIGEMA Walker

(643) 1. **Rigema wœrdeni** (Snellen)

Phalera wœrdeni SNELLEN, 1872, Tijd. v. Ent., XV, p. 45, Pl. IV, figs. 1–3.
Rigema wœrdeni KIRBY, 1892, Cat. Lep. Het., p. 578.

One female caught at Matadi, June 9, 1913.

CATARCTIA Holland

(644) 1. **Catarctia divisa** (Walker)

Arctia (?) *divisa* WALKER, 1855, List Lep. Het. B. M., III, p. 765.
Balacra (?) *divisa* KIRBY, 1892, Cat. Lep. Het., App., p. 907.
Catarctia divisa HOLLAND, 1893, Psyche, VI, p. 537.

One male taken at Medje, August 13, 1910.

CTENOGYNA Felder

(645) 1. **Ctenogyna** (?) **medjensis,** new species

Plate XIV, Figure 10, ♂

♂. Eyes dark brown; palpi pale, darker below, the terminal joint very short; upper side of head, thorax, and abdomen very pale fawn, inclining to yellowish; lower side of thorax and abdomen of the same general color as the upper side, but upon the sides and the lower surface of the two anterior segments of the abdomen there are conspicuous black spots; legs concolorous, the tarsi a trifle darker; antennæ testaceous. The fore wing on the upper side is pale grayish fawn, becoming slightly darker towards the termen; two or three minute dark basal spots, succeeded by a very fine outwardly curved subbasal line; the cell faintly clouded near its extremity by darker brown, and with a minute, but very distinct black spot at its end; beyond the cell a double postmedian line running obliquely from the costa two-thirds of its length from the base to the inner margin at its middle; beyond this line near the costa the wing becomes lighter in color, almost white; for a short distance this lighter area being crossed by a very fine brown line, which runs from the costa as far as vein 6, where it terminates upon the subcostal line; the subcostal line is fine, dark brown, and beginning at the apex curves inwardly at first and then, as it approaches the inner margin, becomes almost parallel with the postmedian line; the space between the subcostal line and the outer margin, near the extremities of veins 5 and 6 is marked by two deep black spots, accentuated externally by lighter scales, which in turn are succeeded by two fine sagittate marks; the costa near the apex is narrowly bordered by white, the tips of the subcostal nervules indicated by minute black spots, the fringes are dark below the apex, but become lighter near the tornus. The hind wing on the upper side is pale creamy white, clouded on the outer margin opposite the end of the cell and at the anal angle with dark scales; the fringes are uniformly whitish. On the under side the ground-color of both wings is creamy white. The fore wing on the costa above the cell, and more broadly beyond the cell, is clouded with pale gray; there is a faint trace of a discal spot at the end of the cell; a submarginal row of very small, but distinct, dark spots, located on the veins, extends from the costa to the inner margin at about three-fourths of the length of the wing from the base; beyond this line in the region of veins 5–7 are a series of zigzag dark lines, and the fringes near the apex are dark, becoming lighter toward the tornus. The hind wing is on its costal or upper half dusted with gray scales, and there are a few such scales near the anal angle. At the end of the cell there is a minute transverse discal spot; beyond this, running from the costa as far as vein 4, are two parallel outwardly angulated dark lines; the submarginal series of small dark spots, which is conspicuous upon the fore wing, is continued upon the hind wing as far as vein 2, but does not in the type appear upon vein 1; the dark shades beyond the end of the cell of the upper side reappear upon the lower side, but are darker on the lower side. Expanse, 46 mm.

The type, which is unique, was taken at Medje, August 1, 1910, and is in The American Museum of Natural History.

The insect is strictly congeneric with the species which I described as *Ctenogyna (?) vilis* and *Ctenogyna (?) ogovensis* (cf. Entomological News, IV, 1893, p. 343, Pl. xv, figs. 12, 13). The type of the genus *Ctenogyna* is the species named *natalensis* by Felder, which I do not have in my collection but which I think I saw in London or at Tring and the likeness of which to the insects before me I recognized at the time. The generic reference is provisional, but possibly quite correct. It is, however, not wise to dogmatize in such matters.

ANAPHE Walker

(646) 1. **Anaphe infracta** Walsingham

Anaphe infracta WALSINGHAM, 1885, Trans. Linn. Soc. London, (2) II, p. 422, Pl. XLV, fig. 8.

One damaged male specimen caught at Faradje, "1911–1912."

Geometridæ

Boarmiinæ

HYPHENOPHORA Warren

(647) 1. **Hyphenophora palumbata** Warren

Hyphenophora palumbata WARREN, 1894, Nov. Zool., I, p. 402. SWINHOE, 1904, Trans. Ent. Soc. London, p. 498.

One specimen taken at Medje in the early part of August 1910. It agrees with specimens in my collection which have been compared with Warren's type. We have numerous examples from the valley of the Ogové and from Cameroon.

(648) 2. **Hyphenophora perlimbata** (Guenée)

Palyas perlimbata GUENÉE, 1857, Phal., I, p. 396.
Hyphenophora perlimbata SWINHOE, 1904, Trans. Ent. Soc. London, p. 498.

One badly damaged specimen captured at Stanleyville, August 23, 1909, and a better one taken at Medje in the first week of August 1910.

RHAMIDAVA Walker

(649) 1. **Rhamidava amplissimata** (Walker)

Acidalia (?) *amplissimata* WALKER, 1862, List Lep. Het. B. M., XXVI, p. 1614.
Rhamidava amplissimata SWINHOE, 1904, Trans. Ent. Soc. London, p. 499.

One example caught at Ukaturaka, July 1909, and four taken at Medje, the dates of capture running from July to September. This insect seems to be quite common in tropical West Africa and the region of the Congo, judging from the number of specimens in our possession, some of which have been compared with Walker's type.

(650) 2. **Rhamidava** (?) **pieridaria,** new species

Plate XIV, Figure 13, ♀

♀. Eyes, frons, upper side of head and thorax grayish; the lower side of thorax and entire abdomen pale yellowish gray, lighter than the upper side of the thorax. Fore wing on the upper side white from the base to the outer third, with a few minute striæ on the costa; a minute black point near the end of the cell; the outer third of the wing is deep black, the inner margin being straight as far as vein 3, and then indented on veins 2 and 3, the white ground-color extending outwardly at the inner angle of the wing as far as the margin; the hind wing on the upper side is broadly white save near the upper angle, where it is broadly shaded with blackish. There is an extremely minute black point near the end of the cell in the hind wing, and a very faint transverse postmedian line, composed of minute transverse striæ. The wings on the under side are marked exactly as on the upper side, except that the dark outer spots are much paler and the striæ on the costa of the fore wing near the base somewhat more pronounced than on the upper side. Expanse, 38 mm.

The type, which is unique, was taken at Medje on July 8, 1910. The insect closely resembles in its markings some species of the rhopalocerous genus *Pieris*. Its reference to the genus *Rhamidava* is purely provisional, as the specimen, aside from the wings, is in too poor condition to enable an exact diagnosis to be made, the legs being missing and there being only a fragment of one antenna, which shows that the antennæ are simple. I hesitated to describe this insect because of the imperfect condition of the type but, after examining all of the literature, I have failed to recognize any description of an African geometrid which seems to correspond with it. The type is in The American Museum of Natural History.

MELINOESSA[1] Herrich-Schæffer

(651) 1. **Melinoessa crœsaria** Herrich-Schæffer

Melinoessa crœsaria HERRICH-SCHÆFFER, 1855, Aussereur. Schmett., Pl. LXV, fig. 370. SWINHOE, 1904, Trans. Ent. Soc. London, p. 499.

One badly damaged specimen taken at Medje, August 12, 1910.

(652) 2. **Melinoessa** (?) species

A damaged specimen from Medje, taken in September 1919, belongs without much doubt to this genus, and seems to be nondescript, but I hesitate to name it.

SEMIOTHISA Hübner

(653) 1. **Semiothisa** species (?)

There is a single specimen taken at Medje, July 29, 1910, which belongs to this genus but which I am unable to refer to any species known to me either by the figures or descriptions which have been given. As most of the verbal descriptions are, however, very unsatisfactory, and often leave the student in doubt, I hesitate to name the insect as new, fearing by so doing to perpetrate a synonym.

---

[1] Swinhoe, *loc. cit.*, sinks *Obrussa catenata* Saalmüller as a synonym of *Melinoessa stellata* Butler, which I think is an error. The two insects resemble each other very closely in the style of marking, but the form of the wings is very different.

ZAMARADA Moore

(654) 1. **Zamarada protrusa** Warren (?)

Zamarada protrusa WARREN, 1897, Nov. Zool., IV, p. 123.

There is one male specimen taken at Medje, July 19, 1910, which seems to be the species described by Warren, but, without the type before me, it is almost impossible to be sure of the identification, the description being very concise and applicable at least in part to several other allied species, of which there are, as I write, a number before me which await determination. The genus is well represented in Africa, and we have in our collections numerous species, which, when I last visited the British Museum and the Museum at Tring, did not seem to be found there. A thorough revision of the African forms of the genus is needed.

HYPOCHROSIS Guenée

(655) 1. **Hypochrosis massagaria** Karsch

Hypochrosis massagaria KARSCH, 1895, Ent. Nachr., XXI, p. 359, Pl. II, fig. 10.

Two specimens, one taken in March the other in September 1910 at Medje.

BUZURA Walker

(656) 1. **Buzura abruptaria** (Walker)

Boarmia abruptaria WALKER, 1869, Proc. Nat. Hist. Soc. Glasgow, I, p. 37.
Buzura abruptaria SWINHOE, 1905, Trans. Ent. Soc. London, p. 528.

A single specimen taken at Avakubi, August 30, 1913. It agrees perfectly with specimens in my collection, which have been identified on comparison with the collections in London and at Tring. In the latter collection I think that Mr. Warren had referred the species to the genus *Eubyjodonta* erected by him in 1893 for the reception of an Indian insect.

BOARMIA Treitschke

(657) 1. **Boarmia acaciaria** Boisduval

Boarmia acaciaria BOISDUVAL, 1834, Faune Ent. Madagr., p. 116, Pl. XVI, fig. 4.

One damaged specimen of the male sex taken at Medje, March 9, 1919. The species is very variable, but the example before me is quite near the typical form originally described from Madagascar.

(658) 2. **Boarmia** species (?)

A badly rubbed female specimen, which I am unable to refer with precision to any species known to me. It may be nondescript. It was captured at Medje, August 6, 1910.

(659) 3. **Boarmia** (?) species

A somewhat defective male, which upon the whole seems best referred to this genus but which I cannot determine specifically. It was caught at Medje, August 3, 1910.

Negla Walker

(660) 1. **Negla tenuiorata** (Walker)

Narthecusa tenuiorata Walker, 1862, List Lep. Het. B. M., XXIV, p. 1140.

Four males and one female of this common species taken at Medje in July and August 1910.

Amnemopsyche Butler

(661) 1. **Amnemopsyche circumdata** (Walker)

Girpa circumdata Walker, 1864, List Lep. Het. B. M., XXXI, p. 209.

Nine specimens from scattered localities, the dates of capture ranging from March to December.

(662) 2. **Amnemopsyche flavibasis** (Warren)

Hylemera flavibasis Warren, 1897, Nov. Zool., IV, p. 241.

A single male specimen caught at Medje, April 6, 1910. The description given by Warren fits the insect so closely as to leave no doubt as to the correctness of the determination. It is strictly congeneric with *G. circumdata* Walker.

Pitthea Walker

(663) 1. **Pitthea continua** Walker

Pitthea continua Walker, 1854, List Lep. Het. B. M., II, p. 463.

Three specimens, two caught at Medje, one in April and the other in August, the third captured at Niangara in November 1910.

(664) 2. **Pitthea famulita,** new species

Plate XIII, Figure 3, ♂

♂. Superficially resembling *P. famula* (Drury), but much smaller, with narrower wings, and different markings. Antennæ, eyes, and upper side of palpi deep black; lower side of palpi orange; frons, and a narrow line behind each eye pure white; upper side of head, tegulæ, patagia, thorax and upper side of abdomen bluish fuscous; lower side of thorax blackish with orange spots at the insertion of the legs; legs blackish marked on the tibiæ with a fine white line internally; the sternites of the abdomen dark orange, the pleurites having the same color as the top of the abdomen, which is extended downwardly on the sternites on their posterior margin, giving the orange surface of the lower side of the abdomen an annulated appearance. The peculiar organ to which Dr. Karl Jordan calls attention in the Novitates Zoologicæ, XII, p. 506, is well developed, as in all other species of the genus and its allies which are known to me. The prevalent color of the fore wing is black; at the base there are some bluish fuscous scales of the same color as the vestiture of the thorax and abdomen on the upper side, these bluish scales being most noticeable where they overlay the inner area of the subbasal white triangular spot, which extends from near the middle of the cell to the inner margin to a little before the middle of the wing; there is a diagonal moderately broad white subapical band, which does not reach either the costa or the outer margin. The hind wing on the upper side is white, bordered from a little before the middle of the costa with black which sweeps around the wing to the base, but on the inner margin is heavily clothed with bluish fuscous hairs. On the under side the wings are much as on the upper side, but there is a small orange spot at the very base of the hind wing. Expanse, 37 mm.

The type, which is unique, was taken at Medje in the early part of August 1910 and is deposited in The American Museum of Natural History.

Orthostixinæ

ALETIS Hübner

(665) 1. **Aletis helcita** (Clerck)

Papilio helcita CLERCK, 1764, Icones Ins., II, Pl. XXXIX, fig. 4.
Aletis helcita SWINHOE, 1904, Trans. Ent. Soc. London, p. 578.

Six specimens, five taken at Medje in the middle months of the year and one at Niangara in November.

Larentiinæ

GONANTICLEA Swinhoe

(666) 1. **Gonanticlea** (?) **langaria,** new species

Plate XIV, Figure 9, ♂

♂. Antennæ pectinate; tibia of hind legs not dilated, having two pairs of spurs; fore wing truncate at apex; hind wings truncate and straight from anal angle to extremity of vein 4, twice denticulate between vein 4 and the upper angle; frons white; vertex ochraceous; upper side of thorax and abdomen very pale gray; under side of thorax and abdomen whitish; legs concolorous; fore wing on the upper side prevalently pale gray tinged with pink, irrorated with pale brown striæ; an antimedian greenish band marked at the costa with a brown spot, runs from the costa to the hind margin; this is succeeded by a postmedian irregular band made up of small sagittate points, their apices pointing basad, the spot on the costa most conspicuous. This band is followed by a pale greenish shade, most noticeable in the subapical region. There is an irregular submarginal band, composed of brown sagittate spots, beyond which, between veins 4 and 5, is a whitish patch, and behind which, near the inner angle, there is a similar whitish lunular patch accentuated externally by dark brown. There are traces near the lower angle of a fine dark marginal line. The fringes are dark brown, checkered with lighter between the apex and vein 4. The hind wing on the upper side is marked like the fore wing, the transverse bands of the fore wing being continued across it, but narrower and less distinct. There is a minute black point at the end of the cell. The hind margin of the wing, from the anal angle to the extremity of vein 4, is broadly dark brown. On the under side the markings of the upper side are reproduced, but less distinctly and more diffused, and the outer half of both wings is more or less shaded with greenish. On the fore wings the ends of the nervules are distinctly accentuated by dark brown dots, between the apex and vein 4, and on the hind wing, in a similar manner, the ends of the nervules between the upper angle and vein 4 are tipped with dark brown, while the fringes of the straight portion of the outer margin between the anal angle and vein 4 are pale greenish white without maculations. Expanse, 40 mm.

The type, which is unique, was taken at Medje in July 1914 and is deposited in The American Museum of Natural History.

I refer the insect to the genus *Gonanticlea* provisionally. It seems by reason of the straightness of the posterior margin of the hind wing from the anal angle to the extremity of vein 4 to differ, but otherwise corresponds very well with Swinhoe's description and figure of the genus.

Acidaliinæ

ACIDALIA Treitschke

(667) 1. **Acidalia** (?) **medjaria,** new species

♂. Closely resembling *Pseudasthena permutans* Hampson (cf. Ill. Lep. Het. in B. M., 1892, VIII, p. 123, Pl. CLIII, figs. 17–21) but very much smaller in size, and differing in the markings of the wings. Hampson gives the expanse of his species from Ceylon as "one inch" =25 mm.; the insect before me has an expanse of only 13 mm., that is to say it is only about half the size of the moth described and figured by Hampson. In its coloration it closely resembles the female specimen represented by Hampson in his figure 20, but the pale yellow outer border is relatively wider in *A. medjaria*, and the dark inner area of the wing is solidly deep purplish pink, without any trace of transverse lines or punctulations.

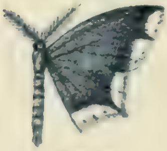


Fig. 6.
Acidalia medjaria, ♂. $\frac{2}{1}$.

The type was taken at Medje, June 26, 1910, and belongs to The American Museum of Natural History.

Hampson, in his 'Moths of India,' III, p. 419, sinks *Pseudasthena* Moore as a synonym of *Cambogia* Guenée and puts his *Pseudasthena permutans* into *Acidalia* (*loc. cit.*, p. 441). As *A.* (?) *medjaria* seems to me to be congeneric with *permutans*, I follow Hampson provisionally, at the same time expressing a doubt as to the correctness of the reference to the genus *Acidalia*, the type of which is *A. ochrata* (Scopoli).

PRASINOCYMA Warren

(668) 1. **Prasinocyma unipuncta** Warren

Prasinocyma unipuncta WARREN, 1897, Nov. Zool., IV, p. 44.

There is one specimen taken at Matadi, June 24, 1909. We have a long series of specimens in our collections.

PROBLEPSIS Lederer

(669) 1. **Problepsis ægretta** Felder

Problepsis ægretta FELDER, 1867, Reise Novara, Lep., Pl. CXXVIII, fig. 14.

A single specimen, agreeing with those in the British Museum and others in my collection, which have been compared with them. It was caught at Banana, June 21, 1909.

OSTEOSEMA Warren

(670) 1. **Osteosema** (?) **phyllobrota,** new species

Plate XIV, Figure 6, ♂

♂, ♀. Eyes black; frons, palpi, vertex, and antennæ pale gray; the antennæ are relatively short in both sexes, bipectinate until near the tip; the collar is whitish; the patagia and upper side of the thorax are deep grass-green; the lower side of the thorax and the entire abdomen are pale gray, or whitish; the legs are also pale gray, the hind tibia armed at the end with two spurs. The costa of the fore wing is gray, densely irrorated with dark brown scales, most numerous on the margin; there is a very fine whitish subcostal line from the base to the apex; the basal half of the wing is grass-green, dissected into three spots by two fine white lines running inwardly from the costa, the first of these lines being located about one-fifth the length of the costa from the base, the second at the end of the cell, the first line extending to the inner margin, the second being lost in the pale outer area of the wing; the basal green spot is subtriangular, the middle spot, which is the largest, is pentagonal, the outer spot, located near the costa at the end of the cell, is the smallest, and is triangular. The outer half of the wing is cream-color, more or less densely punctated with minute transverse brown striæ; there is a large green subapical spot very irregular in its outline, which extends from the subcostal line downward and outward, almost touching the outer margin about its middle, this spot near the apex is traversed by a fine white line on vein 7 cutting off a small triangle of green; at its lower end it is rounded and continued downward by a small lobular extension located between veins 3 and 4; the inner angle of the wing is clouded with a few brown scales; there is a fine dark brown marginal line; the fringes are whitish. The hind wing on the costa is pure white from the base to near the upper angle of the wing; at the base of the wing adjacent to the inner margin is a large green spot, defined outwardly by an irregular narrow white line, angulated outwardly at the end of the cell, and defined outwardly by a narrow green shade, broadest near the costa. The broad pale area beyond this line is marked as on the fore wing with minute transverse dark striæ, beyond it on the submarginal area, extending from the upper angle of the wing downward to vein 2 is a long irregularly shaped green spot defined outwardly by white; the anal angle is clouded with dark brown, the dark brown marginal line and the fringes are as on the fore wing. On the under side both wings are silky white.

The female does not differ materially from the male in the pattern of the markings of the wing, except that the green spots show a tendency to become obsolete and to fade into the paler surrounding areas of the wing, this being particularly true of the hind wing, which in one specimen before me has the marginal green spot of the hind wing almost altogether lost. Expanse, 32–35 mm.

The foregoing description is based upon a specimen which was taken at Medje, September 1, 1910, by the American Museum Congo Expedition, supplemented by three males and two females in the collection of the Carnegie Museum from Cameroon, and three males and two females in the Holland Collection from the valley of the Ogové River. Some years ago I took a number of African Geometridæ with me to Europe for study and while at Tring I marked this species as agreeing best with the genus named *Osteosema* by Warren. At that time it did not appear to be represented in either the British Museum or the collection of Lord Rothschild. It is possible that it has since then been described by some author, but, after having devoted many hours to the perusal of everything which has been printed, I am inclined to think that I am justified in regarding the insect as hitherto nondescript. Unfortunately we have no figures of multitudes of species named in recent years, and the descriptions which have been given are, in many cases, very unsatisfactory. The type, which is a male, is in The American Museum of Natural History, the paratypes are in the Holland Collection and the general collection in the Carnegie Museum.

Geometrinæ

PSEUDOTERPNA Hübner

(671) 1. **Pseudoterpna ruginaria** (Guenée)

Hypochroma ruginaria GUENÉE, 1857, Phal., I, p. 278.
Pseudoterpna ruginaria HAMPSON, 1895, Moths of India, III, p. 472.

One specimen caught at Medje, August 9, 1910.

(672) 2. **Pseudoterpna** (?) **chapinaria,** new species

Plate XIII, Figure 19, ♂

♂. Antennæ slightly pectinated; the hind tibia dilated, with two pairs of spurs, one at the end, another a little distal to the middle; eyes brown; body pale gray; first segment of abdomen whitish; legs concolorous; fore wings on the upper side pale gray; a narrow, somewhat diffuse outwardly curved subbasal line; a faint dark linear mark at the end of the cell, losing itself in the transverse median diffuse dark band which runs from the costa to vein 2, where it curves abruptly inward, and then is extended vertically to the inner margin about its middle. This band is succeeded by a postmedian band, which runs from the costa in a curved line to vein 2, where it descends to the inner margin vertically, parallel to the lower extremity of the median line. The postmedian line is succeeded near the apex by a dark, somewhat diffuse, crenulate subapical line, which runs from the costa to vein 5, where it coalesces with the postmedian line. The margin is marked by a very fine dark line; the fringes are dark gray, checkered with pale gray at the ends of the nervules. The hind wings are colored like the fore wings; the subbasal line of the fore wing is continued on the hind wing as a short waved line, reaching the inner margin before the middle. There is a dark spot at the end of the cell, coalescing with the median line, which is irregular, festooned, looped inwardly at the end of the cell and on vein 1. The postmedian line is regularly crenulate, running from near the upper angle of the wing to the inner margin, which it reaches four-fifths of the distance from the base. It is succeeded outwardly by a submarginal fine crenulate line which follows the curvature of the hind wing, enclosing between its crenulations which occur on the veins a series of paler spaces, which are outwardly bordered by the fine marginal line. The fringes of the hind wing are uniformly whitish. On the under side the ground-color of the wings is pale yellowish white; the apex of the fore wing is narrowly pure white. There is a dark triangular shade at the base of the fore wing from the subcostal to vein 1; the median band is black, much broader and more sharply defined than on the upper side; the postmedian band is also broad and black, and coalesces with a similar broad black submarginal band at vein 5, leaving between them a pale yellow elongated spot running from the costa as far as vein 5. The outer dark band touches the outer margin of the wing opposite the end of the cell. The hind wing on the lower side is colored like the fore wing; there is a somewhat large, diffuse subcircular dark spot in the cell about its middle. The wing is crossed at the middle by a broad dark median line running from the middle of the costa to the inner margin at the anal angle, and slightly angulated opposite the end of the cell; the outer margin is broadly black; fringes white. Expanse, 24 mm.

At the risk of adding to the synonymy I have described this species as new, after long search having failed to recognize it in any description which is before me. I am not quite certain of the generic reference, but the insect, in spite of its small size, seems to belong structurally better in the genus *Pseudoterpna*, as defined by Hampson, than in any other. The type is in The American Museum of Natural History. There is no indication of locality on the label. A paratype is in the Holland Collection from the valley of the Ogové River. In the paratype the basal area of the fore wing on the under side is much darker than in the type.

In addition to the species of Geometridæ which have been hereinbefore enumerated and described, there are a few ragged and imperfect specimens which are too poor to determine and which I have been unable to locate.

Saturniidæ

PHILOSAMIA Grote

(673) 1. **Philosamia albida** (Druce)

Attacus albidus DRUCE, 1886, Proc. Zool. Soc. London, p. 409, Pl. XXXVII.

Two rather badly defaced male specimens, one taken at Medje, April 1910, the other labelled "Faradje, 1912."

[*Note.*—Some confusion has existed as to the closely allied species, *Philosamia plœtzi* Plœtz, and I take the present occasion to point out that Maassen and Weyding in Part V, of their Beitr. Schmett., 1885, text, were in error in setting up *P. getula* as a different species from *P. plœtzi.* *P. getula* Maassen and Weyding is the female of *P. plœtzi*, as Maassen and Weymer originally held. We have specimens taken *in coitu*, settling the question beyond doubt, and all of the so-called *P. getula* in our collections are females, as shown by the presence of ova in their abdomens, as well as by the shape of the antennæ.]

EUDÆMONIA Hübner

(674) 1. **Eudæmonia brachyura minor**, new variety

The synonymy of *E. brachyura* (Drury) is as follows:

Attacus brachyura DRURY, 1780, Ill. Exot. Ent., III, Pl. XXIX, fig. 1.
Bombyx argus FABRICIUS, 1781, Spec. Ins., II, p. 170.
Eudæmonia uroarge HÜBNER, 1822 (?), Verzeich. bek. Schmett., p. 151.
Eudæmonia brachyura ROTHSCHILD, 1895, Nov. Zool., II, p. 48.
Eudæmonia brachyura BEUTENMÜLLER, 1897, Journ. N. Y. Ent. Soc., V, p. 166, Pls. XI, XII; 1901, idem, IX, p. 195.

I now propose a new varietal name for the form represented by a single specimen of this insect in the collection, which was captured at Avakubi, December 11, 1909. It agrees with a number of other specimens which we have in our collections from the Ogové River and Cameroon in being of much smaller size and differently marked from the insect figured by Drury and also by Beutenmüller, which probably represents a race occurring in Sierra Leone; I feel that it is worthy of at least a varietal name. It may be in fact another species, and for many years past I have inclined to so regard it.

♂. Prevalent color rosy ashen-gray, the middle of the long tails darker rosy brown, the spatulate extremity inclining to yellowish. Without any trace of the postmedian pale yellow band upon the primaries, shown in the figures given by Drury and Stoll and in Beutenmüller's photographs. A small ocellus in the cell of the primaries at the lower outer angle, and beyond the cell in the same wing a transverse series of from two to four small semitranslucent ocelli, which are variable not only in number but in size, some being in one specimen very pale, annulated with dark brown, in others darker, the light inner spot being more or less obliterated. The secondaries have a yellow semitranslucent circular spot at the end of the cell, which seems to be always distinctly annulated with dark brown, especially distinct in the female sex. Beyond the cell there is a tranverse series of circular pale yellow semitranslucent spots, ringed with darker brown, they being also variable in number and size, as they are in the fore wing. Expanse: ♂, 20-22 mm. (or about one and one-half inches); ♀, 25-28 mm. (or at most one and seven-eighths of an inch).

The foregoing description is based upon a pair of finely preserved and very perfect specimens (type ♂ and allotype ♀) in the Holland Collection in the Carnegie Museum, which were received from Dr. O. Staudinger and said by him to come from Sierra Leone. The single somewhat defective specimen in the collection upon which I am reporting agrees with these types in size, and in the markings, and may be accepted as a paratype. We have other specimens.

TAGOROPSIS Felder

(675) 1. **Tagoropsis gemmifera** (Butler)

Copaxa gemmifera BUTLER, 1878, Proc. Zool. Soc. London, p. 387.

Two male specimens taken at Medje, one in August, the other in September. This insect seems to be not uncommon on the Ogové River and in Cameroon. I possess a good series of both sexes. The females are paler than the males, the yellow of the wings of the males being replaced in the females by white and the outer borders both of the primaries and secondaries being quite broadly laved with pale brown. Some of the males are also whitish, rather than yellow. Attached to a female specimen in my collection is the following manuscript note by the late Dr. A. C. Good: "Taken 5.30 p. m., October 6, 1891, on forest-path. This moth begins to fly just before dark and may occasionally be met along forest-paths at that time, or flying across open spaces. It never stays long out of the forest."

Ceratocampidæ

CIRINA Walker

(676) 1. **Cirina similis** Distant

Cirina similis DISTANT, 1897, Ann. Mag. Nat. Hist., (6) XIX, p. 393; 1903, Ins. Transvaal, p. 62, Pl. III, figs. 1, 2.

Three male specimens taken at Medje, two in June and one in August. They agree very well with the figure of the male given by Distant, so far as their worn condition permits comparison.

BUNÆA Hübner

(677) 1. **Bunæa alcinoë** (Stoll)

Attacus alcinoë STOLL, 1780, Cramer, Pap. Exot., IV, Pl. CCCXXII, figs. *A*, *B*.

A male and a female in damaged condition taken at "Faradje, 1911."

IMBRASIA Hübner

(678) 1. **Imbrasia epimethea** (Drury) (?)

Attacus epimethea DRURY, 1773, Ill. Exot. Ent., II, Pl. XIII, fig. 1, ♂.

Gonimbrasia obscura BUTLER, 1878, Ann. Mag. Nat. Hist., (5) II, p. 462. MAASSEN AND WEYDING, 1886, Beitr. Schmett., figs. 84, 85, ♀.

A single female taken at Medje in August. I hesitatingly follow Rothschild (1895, Nov. Zool., II, p. 39) in sinking *I. obscura* (Butler) as a synonym of *Attacus* (*Imbrasia*) *epimethea* Drury. We have long series of males and females bred by the late Dr. A. C. Good on the

Ogové River and at Efulen, Cameroon, the females of which are unmistakeably referable to *obscura* Butler. The males do not agree with Drury's figure of the insect he named *A. epimethea* in that they lack the dark costal area on the upper side of the secondaries, well shown in Drury's figure. We have, however, a number of males, not bred from larvæ but captured at various localities, which agree absolutely with Drury's figure of *epimethea* and which have a different facies from the males which by the test of breeding are known to be that sex of *obscura* Butler. The two forms seem to me to be at least varietally distinct, though very closely allied to each other.

NUDAURELIA Rothschild

(679) 1. **Nudaurelia emini** (Butler)

Antheræa emini BUTLER, 1888, Proc. Zool. Soc. London, p. 84.

A single male, taken at Niangara in June 1913. It agrees absolutely with specimens in the collection of the writer which have been compared with the type in the British Museum.

Uraniidæ

ACROPTERIS Hübner

(680) 1. **Acropteris erycinaria** (Guenée)

Micronia erycinaria GUENÉE, 1857, Uran. and Phal., II, p. 30.

One ragged specimen taken at Medje, August 9, 1910.

Cossidæ

CALLOCOSSUS Aurivillius

(681) 1. **Callocossus langi,** new species

Plate XIV, Figure 8, ♀

♀. Eyes black, frons pale orange with a black spot in the center; tegulæ orange, with a black spot at the insertion and on the posterior margin; patagia orange with two blue-black suboval spots succeeding each other in the middle; a blue-black median dorsal line, which runs from the posterior margin of the tegulæ to the metathorax, but does not appear to be continued upon the dorsum of the abdomen; at the point of union of the thorax and abdomen on either side three orange-yellow spots, bordered with blue-black; dorsal and lateral surfaces of abdomen solidly bluish black until near the end, where there are two orange-yellow streaks on either side; ovipositor yellow at extremity; the legs blackish, as is also the under side of the thorax, except for the presence of some tufts of yellow hairs at the insertion of the legs; anterior segments of the abdomen on the under side dark like the upper side, the posterior segments orange-yellow on the lower side. Both wings on the upper side are pale bluish, densely spotted all over their surface, including the anterior margin of the hind wings, with small pale orange-yellow maculations, those at the end of the cell of the fore wings fusing together to form a large subrotund blotch, and those on the inner margin of the hind wings being so numerous as to cause these margins to appear much lighter than the rest of the wing. Expanse, 67 mm.

The specimen before me does not agree with any of the species hitherto described and figured. It comes nearest to the insect named *Callocossus elegans* by Aurivillius, but is larger and differs in not having "the anterior border of the hind wings orange-yellow," in lacking the "three longitudinal blue-black lines on the back of the thorax and abdomen," and in a number of other minute particulars, which are evident upon a comparison with the description given by Aurivillius, and which are brought out in the more detailed description of the type which was taken at Faradje, September 3, 1912, and is in The American Museum of Natural History.

XYLEUTES Hübner

(682) 1. **Xyleutes sjœstedti** Aurivillius (?)

Xyleutes sjœstedti AURIVILLIUS, 1910, Kilimandjaro Reise, IX, p. 50, Pl. I, figs. 14, 15.

The collection contains a single male, which agrees very well in almost all of the markings of the wings with the figure which Aurivillius gives of what he calls the female of the species named by him as *X. sjœstedti* but does not agree with the figure which he gives of the male of that species. The male before me is a much larger insect than the male figured by Aurivillius (*loc. cit.*), and I am impelled to query whether the association of the sexes made by my learned friend is correct, in view of the fact that, had he not figured the male on his plate, I should unhesitatingly declare that the insect before me is the mate of the female he has delineated, with which it agrees spot for spot. I am of the opinion that Aurivillius' species is a composite, he having associated with his male specimen the female of another species represented by the male before me. If this should eventually prove to be true, a new name will have to be given to the female he figures and the male insect upon which I am now reporting.

The insect was taken at Medje, April 6, 1910. It has an expanse of 105 mm.

AZYGOPHLEPS Hampson

(683) 1. **Azygophleps boisduvali** (Herrich-Schæffer)

Zeuzera boisduvalii HERRICH-SCHÆFFER, 1854, Aussereur. Schmett., fig. 167.
KIRBY, 1892, Cat. Lep. Het., p. 872.

One male caught at Bolengi, July 20, 1909.

Drepanulidæ

MEGADREPANA Holland

(684) 1. **Megadrepana cinerea** Holland

Megadrepana cinerea HOLLAND, 1893, Ent. News, IV, p. 177, Pl. IX, fig. 4.

A single male specimen, taken at Medje, September 27, 1910. It agrees with the type, except that it is ruddier in color than the type, which is cold gray. It seems to be only a slight color-variety, and I discover that it does not differ materially from similar specimens belonging to a long suite of the species, which we have recently received from the interior of Cameroon.

Lasiocampidæ

The Lasiocampidæ of Africa are a wonderful group of insects, comprising numerous genera and a multitude of species, which, on account of the great difference between the sexes both in size and markings, present much difficulty to the student who has not had the opportunity to breed the insects. As a rule the males are much smaller than the females, the latter in some genera being huge moths, while the males are quite small. Unfortunately the collection upon which I am reporting contains only two specimens, and both of these in defective condition. They each seem to represent species which have not hitherto been described. Of one of them I have good specimens from Cameroon and am able therefore to describe the insect. Of the other I have never seen specimens, and no description occurring in the literature of the subject seems to fit it. I am therefore constrained to leave it until by some good chance better material turns up.

LEIPOXAIS Holland

(685) 1. **Leipoxais punctulata,** new species

Plate XIV: Figure 1, ♂; Figure 2, ♀

♂. The color of the body and wings is a moderately deep, reddish brown; the eyes are dark brown; the posterior margin of the thorax is marked by some greenish hoary hairs. The under side of the body is of the same color as the upper side, inclined to be a trifle lighter at the anal extremity, especially in the case of the male sex; the legs, which are heavily clothed with hair, are of the same color as the body, but marked with a minute white point at the end of the tibiæ. The fore wings are crossed by a very irregular subbasal band composed of pale greenish gray sublunulate minute spots, followed by a somewhat lighter spot located in the cell beyond its middle; this spot is succeeded by a very irregular median band of similar light spots running from the costa to the inner margin, a light spot near the end of the cell forming one of the spots of this series. Immediately beyond the end of the cell are two faint parallel longitudinal spots. On the limbal area of the wing there is an irregularly curved series of submarginal light spots, a trifle larger than those forming the subbasal series; the two nearest the inner margin behind the tornus being the largest and becoming somewhat diffuse, forming an irregular light greenish gray blotch near the inner angle of the fore wing. The fringes are dark brown, checkered with light greenish gray. The hind wings are of the same color as the fore wings but a trifle darker in the middle, in the region of the cell and toward the costa; there are traces on the upper side, very indistinct, of a transverse median and postmedian lighter band of spots; the fringes of the hind margin are checkered dark and pale greenish gray, as is the case in the fore wing. On the under side the ground-color is a slightly paler tint of the same color which prevails on the upper side. The markings of the fore wing are very indistinct, consisting merely of a submarginal transverse shade a little before the apex, and a light gray spot near the tornus, the fringes being checkered and appearing exactly as on the upper side. The hind wing, which is strongly produced upward about the middle of the costa, has this tooth-like projection and the adjacent area dark brown, followed by a median and postmedian series of sublunulate pale grayish spots, between which bands the area is somewhat lighter than the remainder of the wing. The inner margin of the hind wing is uniformly pale from the base to the anal angle, with the fringes on the under side checkered dark and light, as is the case with the fore wing.

♀. The female is almost twice the expanse of the male, the fore wings are strongly produced at the apex, the costa being strongly curved and the outer margin slightly excavated below the apex. All the markings which appear upon the wings of the male reappear upon the wings of the female, but somewhat more accentuated. On the under side in the female the apical and outer margin of the area of the fore wing is darker than in the male, and there is a diffuse paler spot at the apical extremity contrasting with the darker surrounding areas. The hind wing is marked on the under side in case of the female very much as the wing of the male, but the mesial band, defined internally and externally by sublunulate markings, is paler than in the male sex, giving the appearance of a broad grayish green fascia. The fringes both on the upper and under side of the hind wing of the female are more distinctly marked than in the male sex, consisting of a series of sublunulate spots defined inwardly and outwardly by fine dark lines. Expanse of male, 32–34 mm.; female, 64 mm.

The type is a beautifully preserved male in perfect condition, collected at Efulen, Cameroon, by Dr. H. L. Weber, on November 29, 1913. The female allotype is an equally perfect specimen collected by Rev. A. I. Good at Lolodorf, Cameroon, October 19, 1915. The paratypes are a male collected by Dr. H. L. Weber at Efulen, Cameroon, November 4, 1912, and the damaged and rubbed specimen taken by the Lang-Chapin Expedition at Medje, August 24, 1910. The three former are in the Carnegie Museum, the latter is in the American Museum of Natural History.

I described in 1894 three species under the genus *Leipoxais*, which I erected for their reception, and the foregoing species is strictly congeneric with these. Dr. Aurivillius has since then described several species of *Leipoxais*, but upon perusal of his descriptions I cannot identify the hereinbefore named insect as one of the species which he has named, and it certainly is not the same as any of the species which I myself have named. I am therefore reasonably certain that I am not perpetrating a synonym.

Chrysopolomidæ

CHRYSOPOLOMA Druce

(686) 1. **Chrysopoloma rudis** (Walker)

Lasiocampa rudis WALKER, 1865, List Lep. Het. B. M., XXXII, p. 561. DEWITZ, 1881, Nov. Act. Acad. Nat. Cur., XLII, p. 79, Pl. III, fig. 24.

One male caught at Medje in July 1910. It agrees closely with specimens in my collection, which were named upon comparison with Walker's type.

(687) 2. **Chrysopoloma inspersa** Hampson

Chrysopoloma inspersa HAMPSON, 1910, Proc. Zool. Soc. London, p. 484, Pl. XL, fig. 16.

A female caught at Faradje "1911–1912," and which corresponds both with the description and figure given by Hampson, except that it is slightly less in the expanse of the wings.

(688) 3. **Chrysopoloma nubila,** new species

♀. Antennæ yellowish; eyes dark brown; palpi, frons, legs, lower side of thorax, and anterior edges of patagia darker than the adjacent parts; the posterior half of the thorax on the upper side, and the entire abdomen reddish fuscous. The fore wing on the upper side purplish gray, becoming darker toward the base, irrorated with minute dark spots not much darker than the ground-color; a small suboval semitransparent white spot at end of the cell, surrounded by a few darker scales; a submarginal dark band running from the costa to the inner margin about four-fifths of the length of the wing from the base, and parallel to the curved outer margin. The hind wings have the same color as the fore wings, but are slightly paler, and toward the base and the inner margin are slightly tinged with roseate; there is a small white spot at the end of the cell like that on the fore wing, but more distinctly annulated with dark scales; the submarginal dark band of the primaries is continued

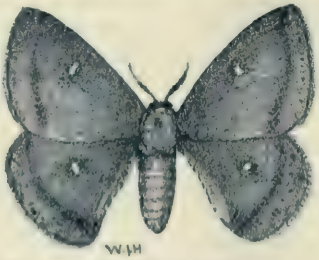


Fig. 7. *Chrysopoloma nubila.* ♀. $\frac{1}{1}$.

upon the secondaries, but is a little more distinct, darker, and wider on the latter. On the under side the wings are marked very much as on the upper side, but are a trifle paler. Expanse, 40 mm.

The type, which is unique, was taken at Niangara, April 9, 1913, and is deposited in The American Museum of Natural History.

Limacodidæ

There are over two hundred species of this family which have already been described from the African continent, and there are, as is known, many others which await description. A revision of the genera and species is much needed, and the writer has been devoting some time in recent years to the task. The Lang-Chapin Expedition brought back only three specimens, representing as many species and two genera.

Parasa Moore

(689) 1. **Parasa vivida** (Walker)

Nyssia vivida Walker, 1865, List Lep. Het. B. M., XXXII, p. 478.

Parasa vivida Kirby, 1892, Cat. Lep. Het., p. 543. Aurivillius, 1906, Arkiv Zool., III, No. 1, p. 11 (larva). Hampson, 1910, Proc. Zool. Soc. London, p. 485.

This species is represented by a single, somewhat worn male, taken at Faradje, "1911–1912."

Walker's type was from Natal. Hampson lists the species from N. E. Rhodesia. We have in the Carnegie Museum a male from Banza Manteka, Congo (Bain Coll.) and two males and five females collected in Sierra Leone by Schaus and Clements. The species is thus seen to have a wide distribution. The female has not hitherto been described but does not differ essentially from the male in color and markings. The antennæ, as is true of this sex in the genus, are filiform; the size is larger than that of the male; and the marginal band of the primaries is relatively a little wider than in the male and the color of the hind wings a trifle deeper.

(690) 2. **Parasa trapezoides** Aurivillius

Parasa trapezoides Aurivillius, 1899, Ent. Tidskr., XX, p. 253; 1904, Arkiv Zool., II, p. 46.

Parasa mesochloris Hampson, 1910, Ann. Mag. Nat. Hist., (8) VI, p. 146.

This species, originally described by Aurivillius from Cameroon, and subsequently by Hampson from the Gold Coast, is represented in the collection by a single male labelled "Banalia, September 22, 1914." There are specimens in the Carnegie Museum from Cameroon, and also in the Holland Collection from the valley of the Ogové River. Neither of the authors who have hitherto written about the species have called attention to the fact that in fresh specimens the nervules on the outer area of the upper surface of the primaries are slightly darker than the brown color of the outer marginal band and are thus clearly defined against it.

CTENOLITA Karsch

(691) 1. **Ctenolita anacompa** Karsch

Ctenolita anacompa KARSCH, 1896, Ent. Nachr., XXII, pp. 273, 283.

A single female, taken at Medje, June 1910, agrees perfectly with specimens in the Holland Collection which were compared by the writer with the type in Berlin.

Zygænidæ

Pompostolinæ

CHARIDEA Guenée

(692) 1. **Charidea hypparchus** (Cramer)

Sphinx hypparchus CRAMER, 1779, Pap. Exot., III, p. 7, Pl. CXCVII, fig. *C*.

One example, Lukolela, July 18, 1909.

(693) 2. **Charidea semiaurata** (Walker)

Euchromia semiaurata WALKER, 1854, List Lep. Het. B. M., I, p. 207.

One male caught at Stanleyville, August 11, 1909, and two other males taken at Medje, July 9 and 19, 1910.

SALIUNCA Walker

(694) 1. **Saliunca thoracica** (Walker)

Tipulodes ? thoracica WALKER, 1856, List Lep. Het. B. M., VII, p. 1626.
Saliunca thoracica WALKER, 1864, List Lep. Het. B. M., XXXI, p. 108.

One specimen taken at Malela, July 8, 1915. It agrees absolutely with a series of specimens in my collection, some of which have been compared with Walker's type.

(695) 2. **Saliunca rubriventris**, new species

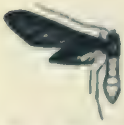


Fig. 8. Saliunca rubriventris, ♀. 1/1.

♀. Antennæ, head, legs, and lower side of thorax black; palpi light brown; upper side of thorax brilliant steely blue; all the segments of the abdomen above and below fiery red, except the first, and having on the sides in the region of the stomata a longitudinal series of fine deep black lines, which do not, however, reach the anal extremity, but terminate on the antepenultimate segment. Wings very much the same as in the preceding species. Expanse, 31 mm.

This species, according to the published descriptions, comes nearest to the insect named *Saliunca ignicincta* by l'Abbé J. de Joannis (cf. Bull. Soc. Ent. Italiana, 1912, XLIV, p. 141) but it is not the same, as a careful perusal of the description of that species plainly shows. The type is unique and is defective in that the antennæ are missing, except a few of the proximal joints. It was taken at Stanleyville, April 9, 1915, and is deposited in The American Museum of Natural History.

Thyrididæ

PROTEROZEUXIS Warren

(696) 1. **Proterozeuxis** (?) **medjensis,** new species

Plate XIV, Figure 12, ♂

♂. Eyes ferruginous, antennæ strongly pectinate, pale ochraceous; tegulæ and patagia pale orange; upper side of thorax and abdomen reddish fuscous, with a narrow band of whitish at the junction of the two; pectus, lower side of the thorax, and abdomen, as well as the legs, pale ochraceous. The fore wings on the upper side are very pale ochraceous, profusely marked with ferruginous lines and striæ, forming reticulations of such a complicated pattern that it would be almost impossible to describe them, but it may be noted that the apex of the wing is relatively free from these striæ, and presents to view a triangular pale space, which is defined inwardly by a fine dark subcrenulate ferruginous line; beyond the cell are two similarly colored parallel lines which run from the costa beyond its middle toward the outer margin and then turn inwardly and downwardly in the direction of the middle of the inner margin, which the line which is basad does not apparently reach; between these lines about the end of the cell are some dark shades and light circular spots; the striæ become more numerous toward the base of the wing, and impart to it a deeper color than the rest of the wing. The upper side of the hind wing is covered like the most of the fore wing with fine reticulated lines, and at the end of the cell there is a darker area corresponding to that on the fore wing. Both wings on the under side are paler than on the upper side, but the lines and markings of the upper side are all reproduced on this side. Expanse, 52 mm.

The type, which is in The American Museum of Natural History, is unique. It was taken at Medje, March 29, 1910.

I have been loath to describe this insect as new to science, but, after trying in vain to reconcile it with available descriptions, have done so. I refer it provisionally to Warren's genus, though it does not seem to quite fit his description, but comes nearer to that than to any other. (See Novitates Zoologicæ, 1899, VI, p. 7.)

Pyralidæ

Schœnobiinæ

CIRRHOCHRISTA Lederer

(697) 1. **Cirrhochrista** species near ? **C. brizoalis** Walker

(Cf. List Lep. Het. B. M., XIX, p. 976) (*an eadem?*)

There is one specimen caught at Banana, June 21, 1909. The insect is plainly referable to the subfamily Schœnobiinæ and to the genus *Cirrhochrista* Lederer. It agrees best upon the whole with the description given by Walker of the species cited above, but, as that species has hitherto only been reported from the Indo-Malayan subregion, I hesitate to declare the identity of our specimen with the form named by Walker, though it may be the same. I cannot just now lay my hands upon Indo-Malayan specimens for comparison, though I think we have some in our collections, which are at the moment inaccessible.

In the markings of the wings this insect agrees absolutely with the insect named *Cirrhochrista saltusalis* by Schaus and Clements (cf. Lep. S. Leone, 1893, p. 43, Pl. III, fig. 7). Of the latter insect we have a long series, but it is not a *Cirrhochrista*, though referred to this genus by the authors of the species. It does not have the porrect palpi, which are characteristic of the genus *Cirrhochrista* and which are marked features of the specimen upon which I am reporting. It is plain that in the case of the insect from Sierra Leone, of which we also have many from the French Congo and Cameroon, we are dealing with a form in which there is parallelism in markings, with positive difference in structure. There is occasion here for further study and investigation.

Pyralinæ

HERCULIA Walker

(698) 1. **Herculia** species (?)

There is a solitary specimen taken at Banana, June 21, 1909, which seems to be referable to this genus, rather than to any other, but I am not sure of the genus. I have never seen the species before and am unable to find a recognizable description of it in the literature of the subject. The insect recalls the color and markings of a species in my collection to which I affixed the note some years ago "*Furcivena* sp.? not in B. M." but, while the color and markings are almost identically the same, the form of the wings is altogether different and quite in agreement, in the case of the insect upon which I am reporting, with the form and neuration of *Herculia*.

Hydrocampinæ

ZEBRONIA Hübner

(699) 1. **Zebronia phenice** (Cramer)

Phalæna phenice CRAMER, 1782, Pap. Exot., IV, p. 185, Pl. CCCLXXXII, fig. *G*.

Two specimens, one taken at Medje, May 10; the other at Ngayu, December 11, 1910.

Pyraustinæ

ZINCKENIA Zeller

(700) 1. **Zinckenia recurvalis** (Fabricius)

Noctua recurvalis FABRICIUS, 1775, Syst. Ent., p. 407.
Hymenia recurvalis SWINHOE, 1900, Eastern Lep. Het., p. 455.

Two specimens, one caught at Banana, June 21, 1909, the other at Stanleyville, no date being given on the label.

PAGYDA Walker

(701) 1. **Pagyda caritalis** Walker

Pagyda caritalis WALKER, 1859, List Lep. Het. B. M., XVIII, p. 569. HAMPSON, 1898, Proc. Zool. Soc. London, p. 636.

One specimen agreeing perfectly with others in my collection which were identified on comparison with Walker's type. The specimen was taken at Avakubi, October 3, 1909.

(702) 2. **Pagyda traducalis** (Zeller)

Eudioptis traducalis ZELLER, 1852, Lep. Caffr., p. 54.
Pagyda traducalis HAMPSON, 1898, Proc. Zool. Soc. London, p. 636.

Two specimens of this widely distributed species, caught at Gamangui, February 17, 1910.

(703) 3. **Pagyda** species (?)

There is a single damaged specimen caught at Lukolela, July 18, 1909, which is structurally nearly allied to the last-mentioned species but is very different in its markings. It may be nondescript, but without more and better material I will not venture to express a positive opinion.

ULOPEZA Zeller

(704) 1. **Ulopeza** species (?)

A rubbed specimen taken at Banana, June 21, 1909, and which I am unable to refer to any species hitherto described, but which ought not to be named with such a specimen as the type.

Filodes Guenée

(705) 1. **Filodes cocytusalis** (Walker)

Euglyphis cocytusalis Walker, 1859, List Lep. Het. B. M., XVIII, p. 540.
Filodes cocytusalis Hampson, 1898, Proc. Zool. Soc. London, p. 671.

One male specimen caught at Medje, June 24, 1910.

Phryganodes Guenée

(706) 1. **Phryganodes sex-guttata,** new species

♂. Near *P. biguttata* Walker, but differing from that species by the presence in the secondaries of a conspicuous black discal mark. The two black spots, one in the middle and the other at the end of the cell of the primaries, are as in *P. biguttata*. Expanse, 30 mm.

The type, which is unique, was taken at Bolengi, July 20, 1909, and is deposited in The American Museum of Natural History.

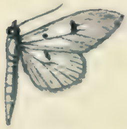


Fig. 9. *Phryganodes sex-guttata*, ♂. 1/1.

(706) 2. **Phryganodes** (?) species (?)

There is a solitary specimen taken at Medje, May 10, 1910, which superficially recalls *P. erebusalis* Hampson (cf. Proc. Zool. Soc. London, 1898, p. 678) but differs from specimens in my collection, which have been compared with Hampson's type, in that the lower side of both wings at and beyond the base are whitish. There are other small and almost undefinable differences, among which the most marked is the fact that the nervules of the primaries on the upper side appear to be accentuated with black scales toward the outer margin, causing them to stand out distinctly on the slightly paler ground-color. The species may be new to science, but without more material it is not wise to describe it as such.

Nacoleia Walker

(708) 1. **Nacoleia pœonalis** (Walker)

Botys pœonalis Walker, 1859, List Lep. Het. B. M., XVIII, p. 639.
Nacoleia pœonalis Hampson, 1898, Proc. Zool. Soc. London, p. 698.

One rubbed example captured at Matadi, June 24, 1909.

(709) 2. **Nacoleia indicata** (Fabricius)

Phalæna-Noctua indicata Fabricius, 1775, Syst. Ent., p. 640.
Nacoleia indicata Hampson, 1898, Proc. Zool. Soc. London, p. 699.

One example caught at Faradje, "1911–1912."

Botyodes Guenée

(710) 1. **Botyodes asialis** Guenée

Botyodes asialis Guenée, 1854, Delt. and Pyr., pp. 321, 348. Hampson, 1898, Proc. Zool. Soc. London, p. 705, fig.

There is one ragged female specimen taken at Medje, April 6, 1910.

Syllepta Hübner

There are three species referable to this genus, but none of them seem to exactly accord with the descriptions and figures which have been published of species occurring in Africa. After devoting considerable time to the study of the literature and the specimens before me, I must reluctantly content myself with merely listing them, as I do not care to describe them as new to science, and indeed it is possible that I have overlooked them in some of the vague and unsatisfactory descriptions of species of which there are so many in this family, but I do not think so.

(711) 1. **Syllepta** species (?)

One specimen caught at Matadi, June 24, 1909.

(712) 2. **Syllepta** species (?)

Two specimens taken at Medje, one on March 9, the other on June 24, 1910.

(713) 3. **Syllepta** species (?)

A solitary specimen taken at Matadi, June 24, 1909.

Agathodes Guenée

(714) 1. **Agathodes musivalis** Guenée

Agathodes musivalis Guenée, 1854, Noct. and Pyr., p. 210, Pl. x, fig. 2. Hampson. 1898, Proc. Zool. Soc. London, p. 731.

Two specimens taken at Medje in May.

Glyphodes Guenée

(715) 1. **Glyphodes sericea** (Drury)

Botys (*Desmia*) *sericea* Drury, 1773, Ill. Exot. Ent., II, p. 11, Pl. vi, fig. 1 (Westwood's Edition).

Glyphodes (*Stemorrhages*) *sericea* Hampson, 1898, Proc. Zool. Soc. London, p. 735.

Seven specimens, one taken at each of the localities, Bolengi, Ukaturaka, and Kwamouth in July 1909; two at Gamangui in February and one at Medje in May 1910, and one at Niangara in April 1913.

(716) 2. **Glyphodes bonjongalis** (Plœtz)

Eudioptis bonjongalis Plœtz, 1880, Stett. Ent. Zeit., XLI, p. 305.
Glyphodes bonjongalis Hampson, 1898, Proc. Zool. Soc. London, p. 739.

Five specimens: one caught at Basoko, July 1909; two at Medje, May 1910; and two at Gamangui in June 1910.

(717) 3. **Glyphodes ocellata** Hampson

Glyphodes ocellata Hampson, 1898, Proc. Zool. Soc. London, p. 739.

One specimen caught at Medje, May 11, 1910.

(718) 4. **Glyphodes ectargyralis** Hampson

Glyphodes ectargyralis Hampson, 1898, Proc. Zool. Soc. London, p. 744, Pl. l, fig. 19.

Three specimens agreeing with others in my collection which were collected in the valley of the Ogové and which have been identified by comparison with Hampson's type. Two of the specimens were taken at Avakubi in October 1909, and one at Medje, June 30, 1910.

(719) 5. **Glyphodes** species (?)

There is a specimen taken at Avakubi, October 3, 1909, which is very near the foregoing, but which differs in that there is a short dark band running from the costa of the secondaries downward and connecting with the fuscous discal patch at the end of the cell in such a manner as to form a V-shaped mark about the middle of the wing. The insect is also smaller and not so robustly formed as the preceding species, of which, however, it may only be a variety.

(720) 6. **Glyphodes sinuata** (Fabricius)

Phalæna sinuata Fabricius, 1781, Spec. Ins., II, p. 267.
Glyphodes sinuata Hampson, 1898, Proc. Zool. Soc. London, p. 747.

There are five specimens of this species, one taken at Batama, September 18, 1909; the others at Medje on dates ranging from March to August 1910.

Sameodes Snellen

(721) 1. **Sameodes cancellalis** (Zeller)

Botys cancellalis Zeller, 1852, Lep. Caffr., p. 34.
Sameodes trithyralis Snellen, 1880, Tijd. v. Ent., p. 218, Pl. viii, fig. 4.
Sameodes cancellalis Hampson, 1899, Proc. Zool. Soc. London, p. 176.

Four specimens taken at Banana, June 21, 1909.

MARUCA Walker

(722) 1. **Maruca testulalis** (Geyer)

Crocidophora testulalis GEYER, 1838, Hübner, Samml. Exot. Schmett., IV, figs. 629, 630.

Maruca testulalis HAMPSON, 1899, Proc. Zool. Soc. London, p. 194, fig.

Of this common and widely distributed species, which occurs all over the tropical zone, there are five specimens taken at as many different localities, the dates of capture ranging from April to October.

PACHYZANCLA Meyrick

(723) 1. **Pachyzancla bipunctalis** (Fabricius)

Phalæna bipunctalis FABRICIUS, 1793, Ent. Syst., III, part 2, p. 232.

Pachyzancla bipunctalis HAMPSON, 1899, Proc. Zool. Soc. London, p. 204.

I refer to this species a specimen labelled "Matadi, June 24, 1909."

In addition to the foregoing species there are several species of Pyralidæ represented by single specimens which I am unable to name satisfactorily without an expenditure of time which I do not feel justified in making, and there are also three species of Tineidæ which I pass by.

Ægeriidæ

TRICHOBAPTES Holland

(724) 1. **Trichobaptes auristrigata** (Plœtz)

Melittia auristrigata PLŒTZ, 1880, Stett. Ent. Zeit., XLI, p. 77.

Trichobaptes sexstriata HOLLAND, 1893, Journ. N. Y. Ent. Soc., I, p. 104.

Four specimens, all caught at Medje, two on April 6, one in June, and one on August 24, 1910.

ÆGERIA Fabricius

(725) 1. **Ægeria nuba** (Beutenmüller)

Sesia nuba BEUTENMÜLLER, 1899, Journ. N. Y. Ent. Soc., VII, p. 171.

One specimen taken at Stanleyville in March 1915, which agrees completely with the types and paratypes in my collection, with which I have compared it.

In conclusion I may mention that there are several cases of bagworms and a couple of inflated larvæ taken from them, which in the entire absence of any imagines I am unable to name. The African Œcophoridæ and Psychidæ are as yet poorly represented in most collections, and in mine by only half a dozen species, to none of which do these specimens seem to belong.

Plate VI

Fig. 1. *Planema nelsoni* (Smith and Kirby), ♂.
Fig. 2. *Planema nelsoni* (Smith and Kirby), ♀.
Fig. 3. *Papilio ridleyanus* White, ♂, typical.
Fig. 4. *Papilio ridleyanus fumosus* Holland, ♀, dimorph.
Fig. 5. *Hypolimnas bartteloti* var. *obliterata* Holland, ♂.
Fig. 6. *Cymothoë diphyia* Karsch, ♀.
Fig. 7. *Neptis agatha* (Stoll) (form from grass-lands), ♂.
Fig. 8. *Neptis agatha* (Stoll) (form from wood-lands), ♂.

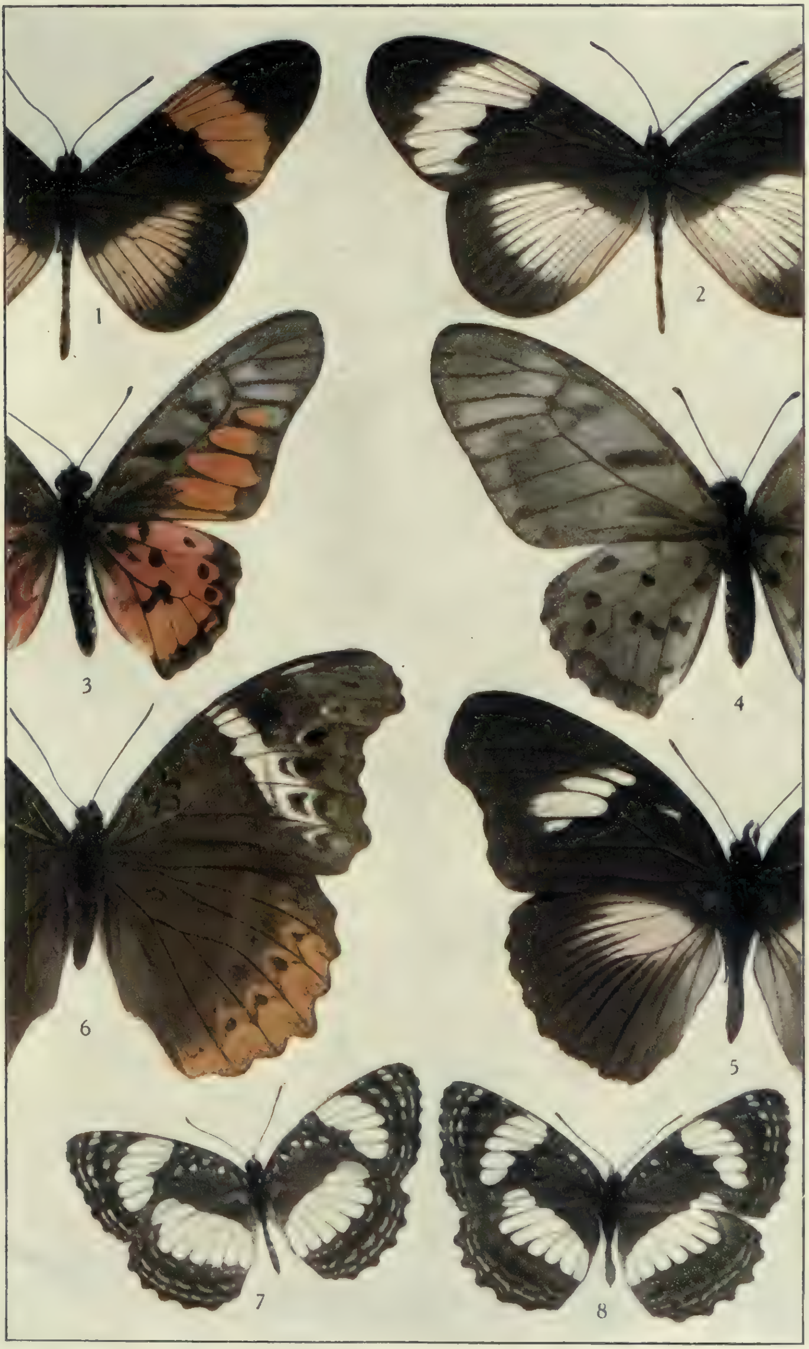

1
2
3
4
6
5
7
8

PLATE VII

Fig. 1. *Bicyclus medontias* var. *obsoletus* Holland, ♂.
Fig. 2. *Euphædra imitans* Holland, ♀, type.
Fig. 3. *Precis stygia stygia* Aurivillius, ♀ (under side).
Fig. 4. *Precis stygia gregorii* (Butler), ♂ (under side).
Fig. 5. *Precis stygia fuscata* Holland, ♀ (under side).
Fig. 6. *Cymothoë cyclades* (Ward), ♂.
Fig. 7. *Kallimula osborni* Holland, ♂, type.
Fig. 8. *Kallimula osborni* Holland, ♀, allotype.
Fig. 9. *Mycalesis chapini* Holland, ♂ (under side).
Fig. 10. *Euryphene maximiniana* Staudinger, ♀.

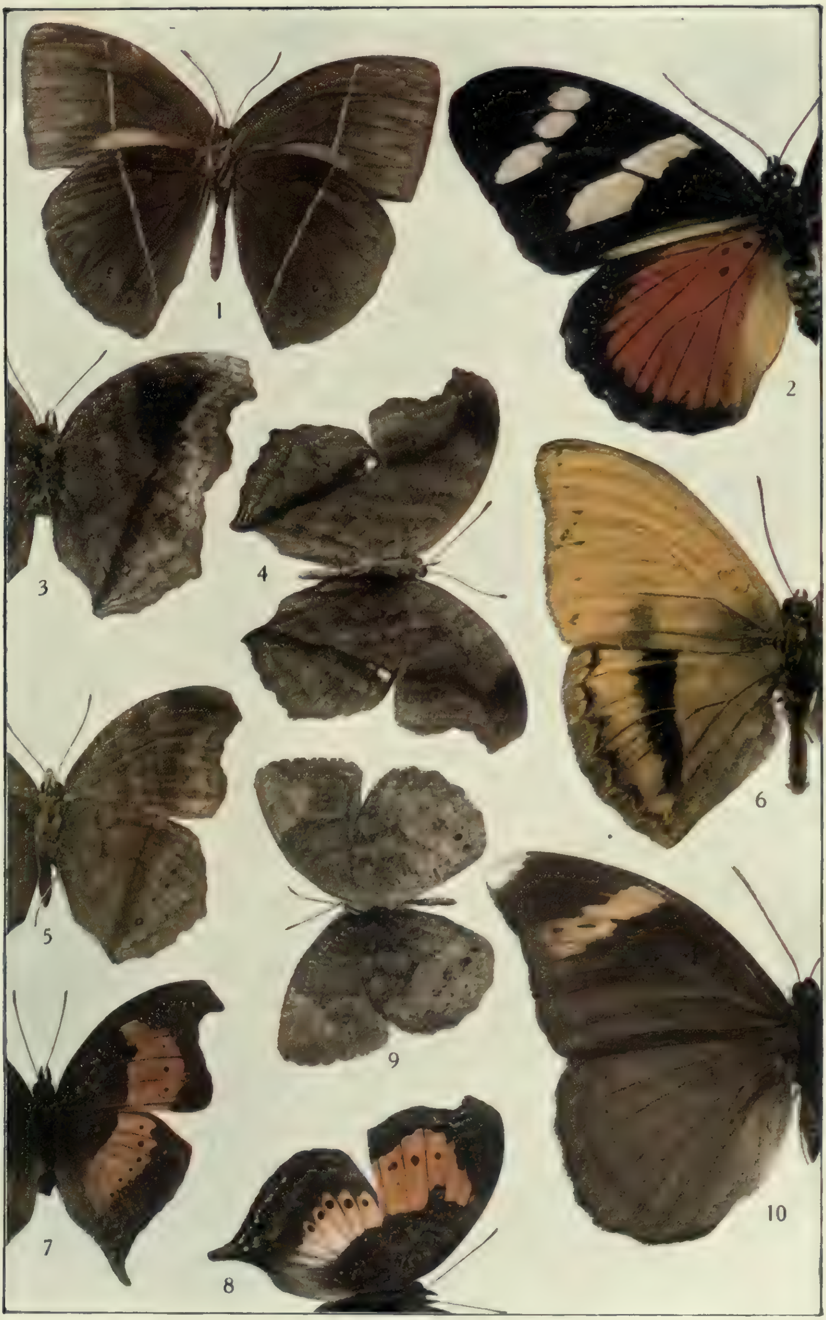

1
2
3
4
6
5
9
10
7
8

Plate VIII

Fig. 1. *Cymothoë herminia* Grose-Smith, ♂.
Fig. 2. *Cymothoë herminia* var. *poënsis* Holland, ♂.
Fig. 3. *Neptis biafra* Ward, ♀.
Fig. 4. *Cymothoë herminia* Grose-Smith, ♀.
Fig. 5. *Cymothoë capellides* Holland, ♂, type.
Fig. 6. *Cymothoë capella* Ward, ♂ (typical).
Fig. 7. *Cymothoë langi* Holland, ♂, type.
Fig. 8. *Cymothoë langi* Holland, ♀, allotype.
Fig. 9. *Cymothoë adelina* Hewitson, ♂ (typical).
Fig. 10. *Cymothoë adelina* Hewitson, ♀ (vera).

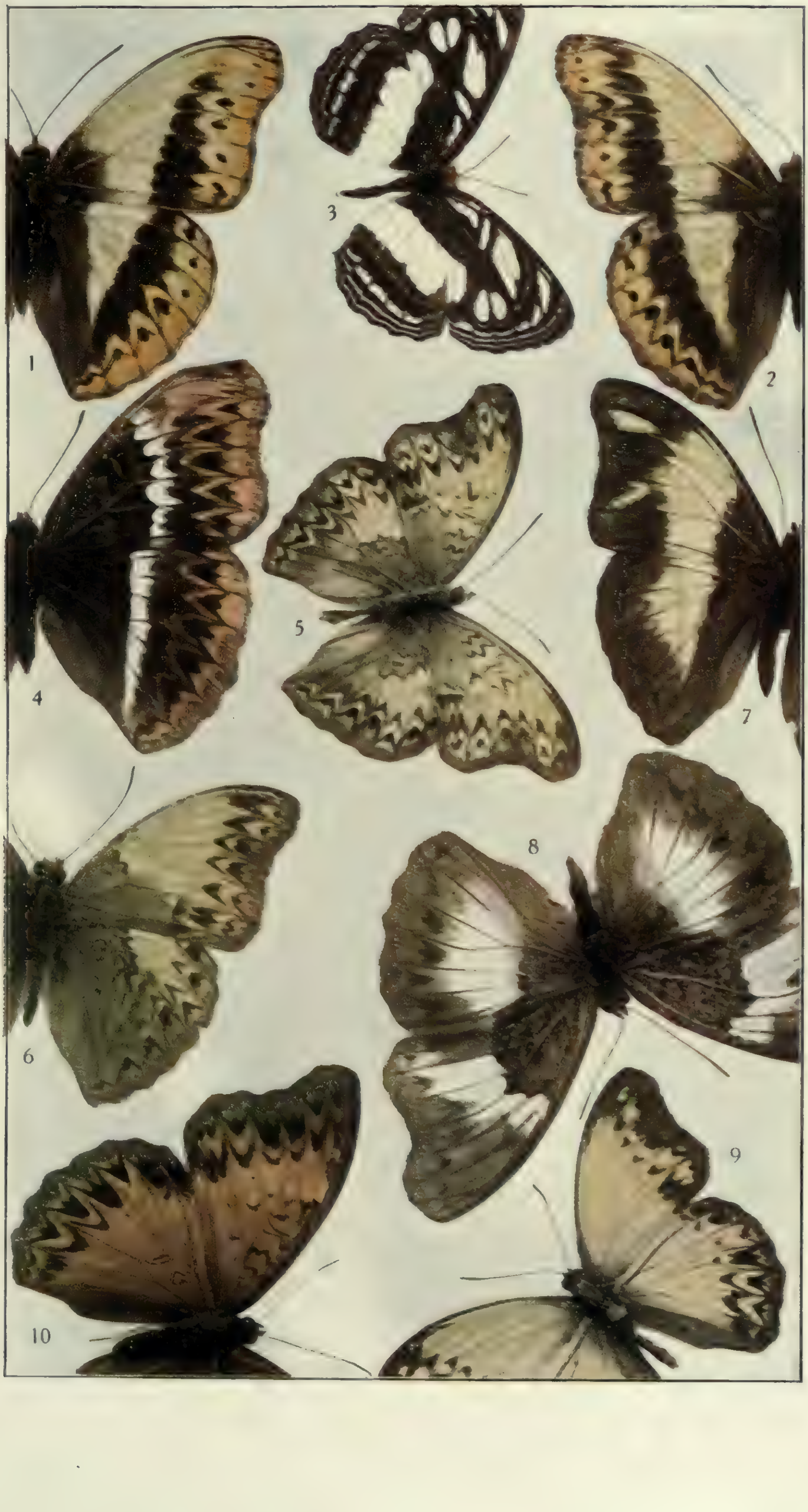

1
2
3
4
5
6
7
8
9
10

PLATE IX

Fig. 1. *Euphædra cyanea* Holland, ♂, type.
Fig. 2. *Euphædra cyanea* Holland, ♀, allotype.
Fig. 3. *Cymothoë cænis,* var. *conformis* Aurivillius, ♀,
Fig. 4. *Euryphene lucasi* Holland, ♂, type.
Fig. 5. *Euryphene lucasi* Holland, ♀, allotype.
Fig. 6. *Euphædra medon* var. *innotata* Holland, ♂, type.
Fig. 7. *Cymothoë cænis,* var. *rubida* Holland, ♀, paratype.

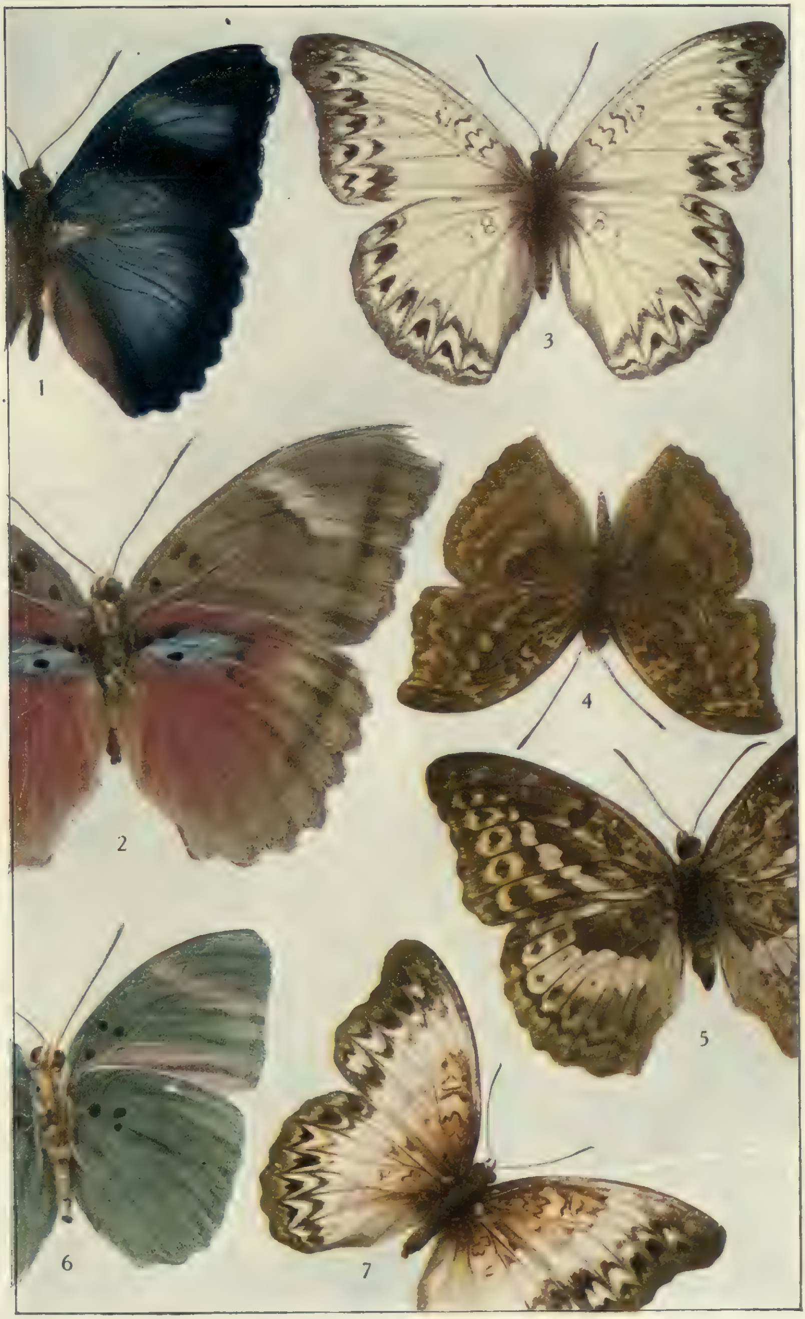

1
3
2
4
5
6
7

Plate X

Fig. 1. *Cymothoë aramis* Hewitson, ♂.
Fig. 2. *Cymothoë aramis* Hewitson, ♀.
Fig. 3. *Cymothoë ogova* Plœtz, ♂.
Fig. 4. *Cymothoë ogova* Plœtz, ♀.
Fig. 5. *Cymothoë Reginæ-Elizabethæ* Holland, ♂, type.
Fig. 6. *Cymothoë Reginæ-Elizabethæ* Holland, ♀, allotype.
Fig. 7. *Cymothoë anatorgis* Hewitson, ♂.
Fig. 8. *Cymothoë anatorgis* Hewitson, ♀.
Fig. 9. *Cymothoë angulifascia* Aurivillius, ♂.
Fig. 10. *Mycalesis langi* Holland, ♂, type.
Fig. 11. *Euryphene fulgurata* Aurivillius, ♀.

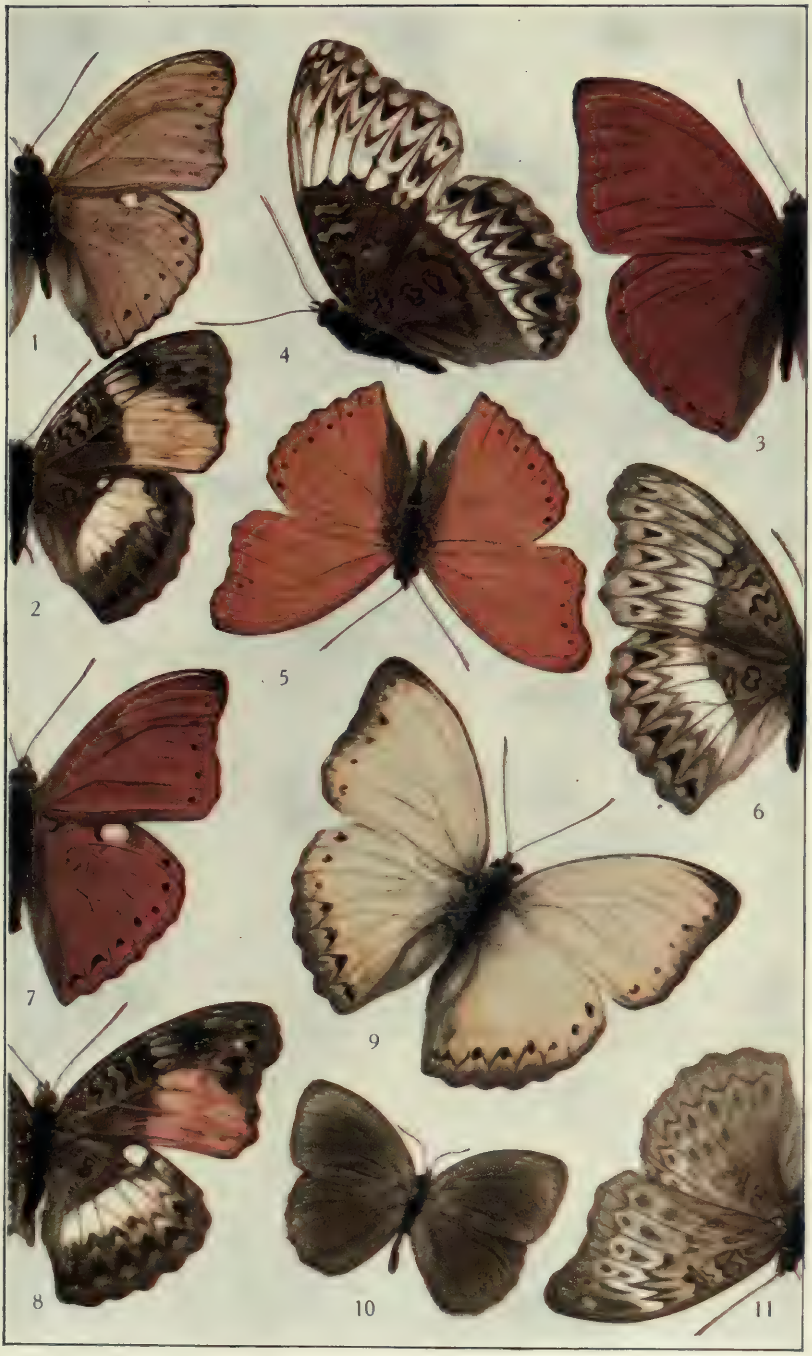

1
4
3
2
5
6
7
9
8
10
11

PLATE XI

Fig. 1. *Euphædra preussi notata* Holland, ♂, type (under side).
Fig. 2. *Euphædra inanoides* Holland, ♂, type.
Fig. 3. *Euphædra inanoides* Holland, ♀, allotype (under side).
Fig. 4. *Euphædra preussi subviridis* Holland, ♂, type (under side).
Fig. 5. *Euphædra rezioides* Holland, ♀, type (under side).
Fig. 6. *Euphædra preussi fulvofasciata* Holland, ♂, type.
Fig. 7. *Euphædra preussi angustior* Holland, ♂, type.
Fig. 8. *Euphædra preussi latefasciata* Holland, ♂, type.

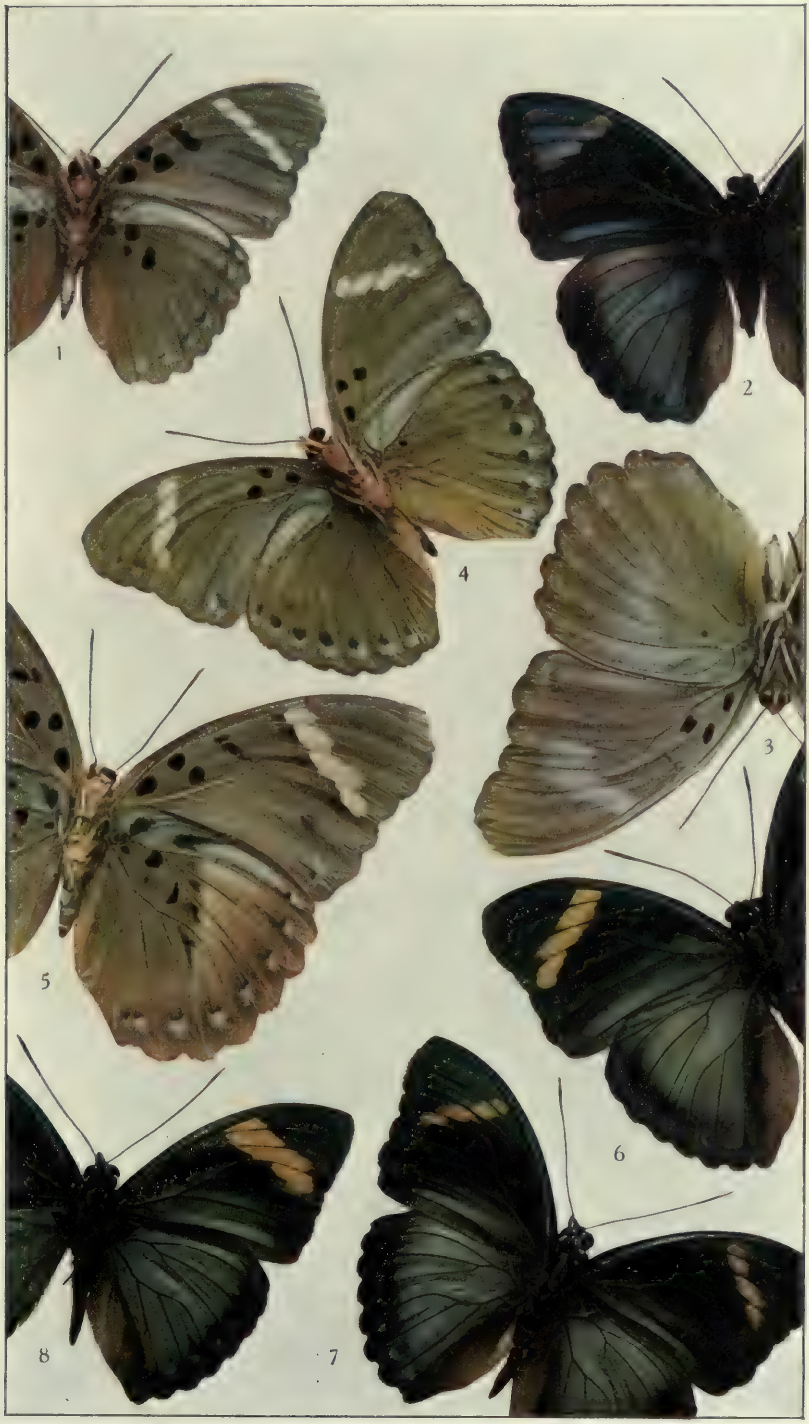

1
2
4
3
5
6
8
7

Plate XII

Fig. 1. *Abantis rubra* Holland, ♂, type.
Fig. 2. *Triclema lutzi* Holland, ♂, type.
Fig. 3. *Leptalina niangarensis* Holland, ♂, type.
Fig. 4. *Spindasis aderna* (Plœtz), ♂.
Fig. 5. *Oxylides homeyeri* (Dewitz), ♀.
Fig. 6. *Spindasis chapini* Holland, ♂, type.
Fig. 7. *Telipna rothioides* Holland, ♀, type.
Fig. 8. *Telipna medjensis* Holland, ♀, type.
Fig. 9. *Pentila clœtensi* Aurivillius, ♂.
Fig. 10. *Epitola langi* Holland, ♂, type.
Fig. 11. *Pentila clarensis* Neave, ♂, form with enlarged discal spots.
Fig. 12. *Pentila clarensis* Neave, ♂, form with smaller, more numerous spots.
Fig. 13. *Diestogyna kahli* Holland, ♂, type.
Fig. 14. *Diestogyna rotundata* Holland, ♂, type.

All figures drawn by W. J. Holland. Natural Size.

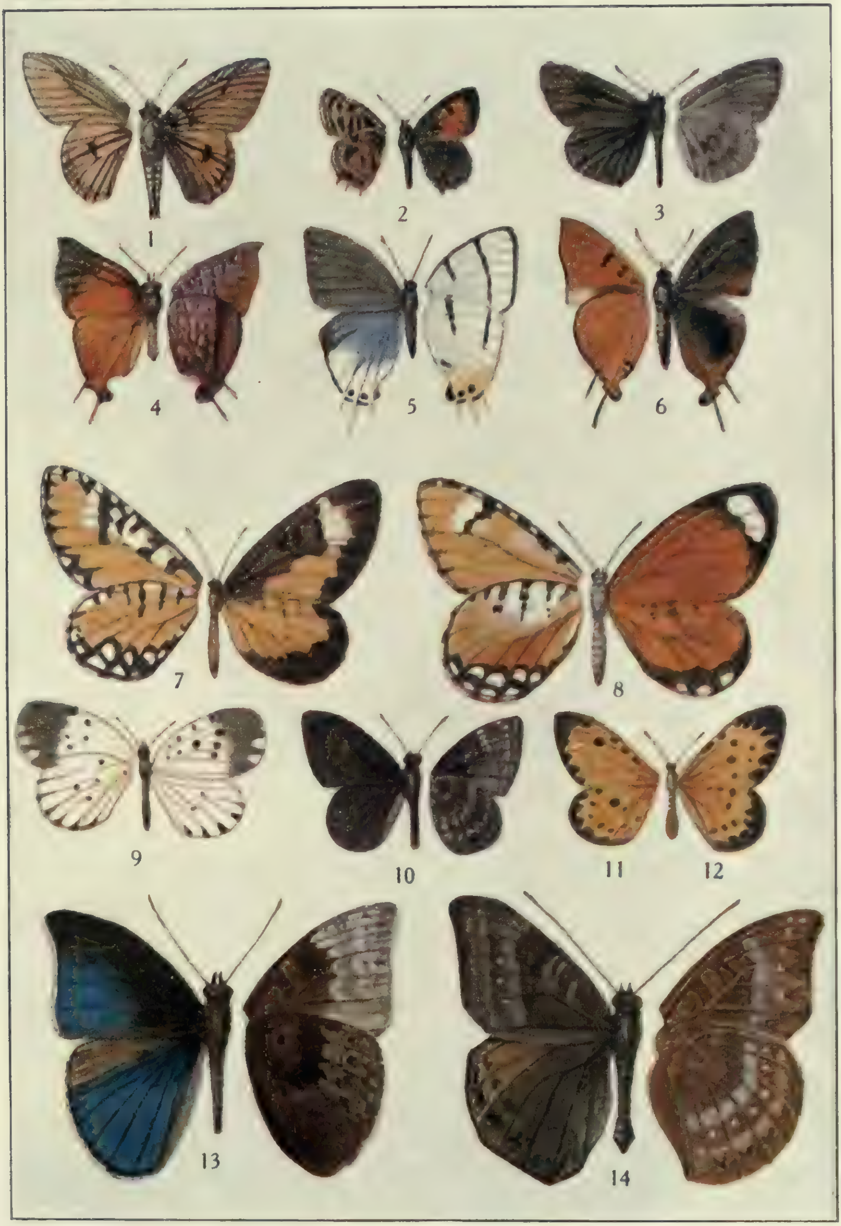

1
2
3
4
5
6
7
8
9
10
11
12
13
14

PLATE XIII

Fig. 1. *Xanthospilopteryx medjensis* Holland, ♂, type.
Fig. 2. *Amphicallia pactolica* (Butler), ♀.
Fig. 3. *Pitthea famulita* Holland, ♂, type.
Fig. 4. *Metarctia chapini* Holland, ♀, type.
Fig. 5. *Pseudogonitis variabilis* Holland, ♂, type.
Fig. 6. *Pseudogonitis variabilis* Holland, ♀, allotype.
Fig. 7. *Pseudogonitis variabilis* Holland, ♀, aberr.
Fig. 8. *Eutelia nigricans* Holland, ♂, type.
Fig. 9. *Tolna bolengensis* Holland, ♂, type.
Fig. 10. *Rhynchodes avakubi* Holland, ♀, type.
Fig. 11. *Amphigonia hyalinata* Holland, ♂, type.
Fig. 12. *Heterospila* (?) *rubida* Holland, ♂, type.
Fig. 13. *Leocyma congoënsis* Holland, ♂, type.
Fig. 14. *Sphingomorpha aliena* Holland, ♂, type.
Fig. 15. *Dermaleipa nubilata* Holland, ♂, type.
Fig. 16. *Deinypena fulvida* Holland, ♂, type.
Fig. 17. *Deinypena transversata* Holland, ♂, type.
Fig. 18. *Deinypena morosa* Holland, ♂, type.
Fig. 19. *Pseudoterpna* (?) *chapinaria* Holland, ♂, type.

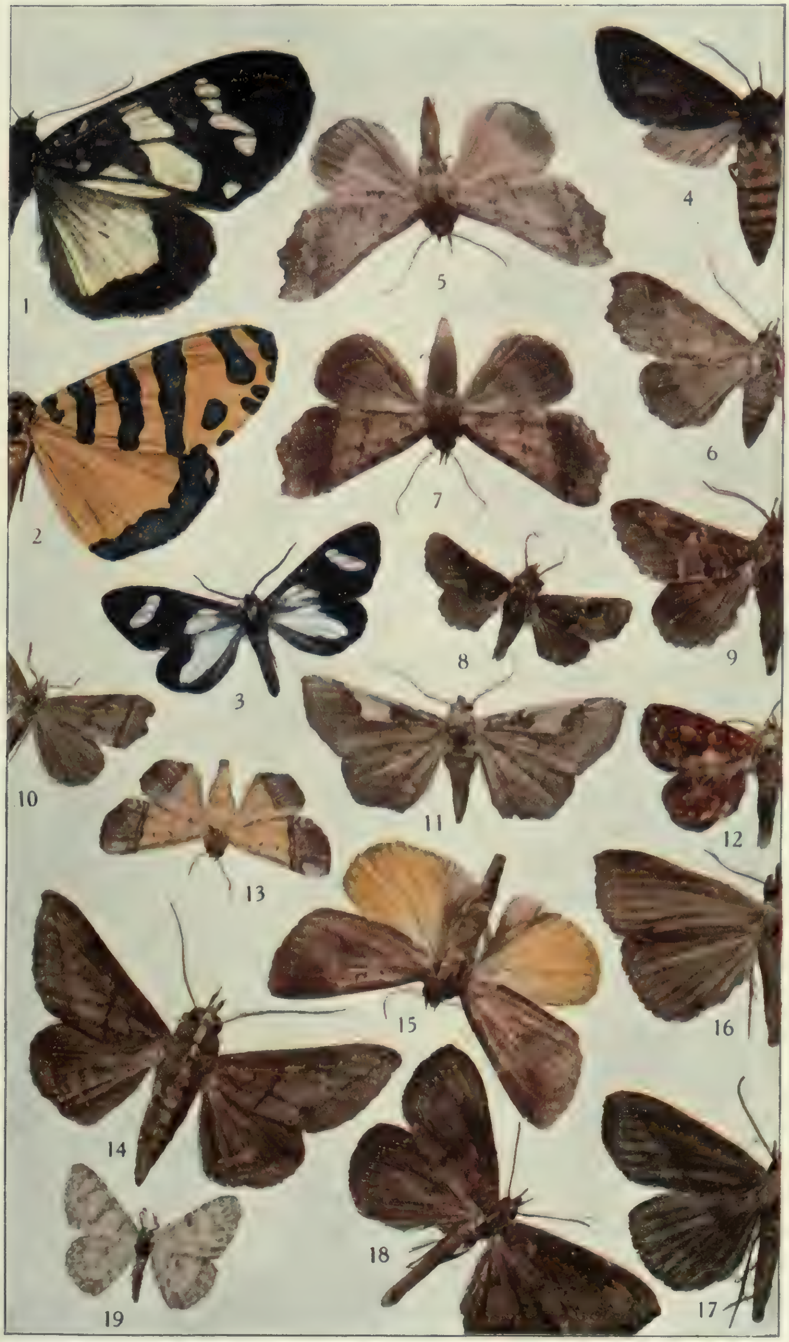
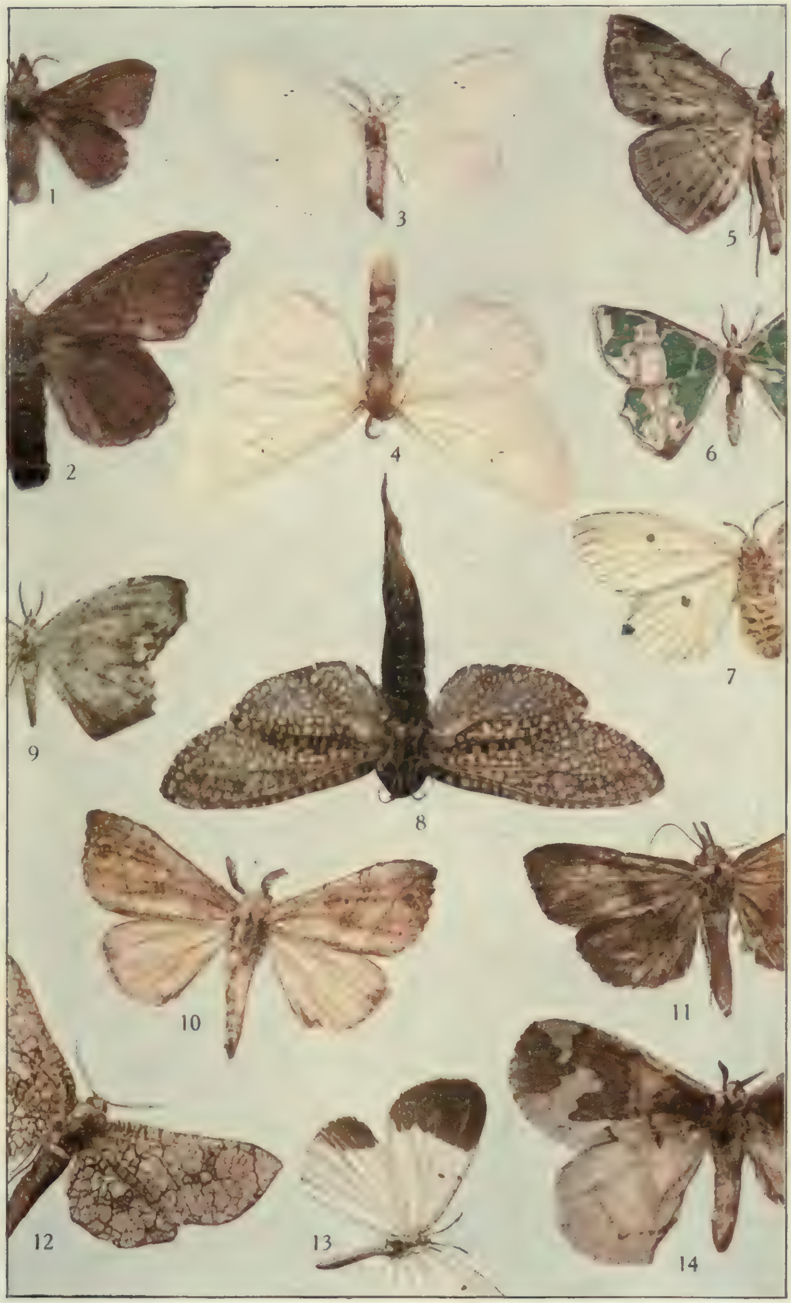

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19

PLATE XIV

Fig. 1. *Leipoxais punctulata* Holland, ♂, type.
Fig. 2. *Leipoxais punctulata* Holland, ♀, allotype.
Fig. 3. *Sapelia bipunctata* Holland, ♂, type.
Fig. 4. *Sapelia bipunctata* Holland, ♀, allotype.
Fig. 5. *Deinypena multilineata* Holland, ♂, type.
Fig. 6. *Osteosema* (?) *phyllobrota* Holland, ♂, type.
Fig. 7. *Lælia soloides* Holland, ♀, type.
Fig. 8. *Callocossus langi* Holland, ♀, type.
Fig. 9. *Gonanticlea* (?) *langaria* Holland, ♂, type.
Fig. 10. *Ctenogyna* (?) *medjensis* Holland, ♂, type.
Fig. 11. *Deinypena obscura* Holland, ♂, type.
Fig. 12. *Proterozeuxis* (?) *medjensis* Holland, ♂, type.
Fig. 13. *Rhamidava* (?) *pieridaria* Holland, ♀, type.
Fig. 14. *Phasicnecus grandiplaga* Holland, ♂, type.


1
3
5
2
4
6
7
9
8
10
11
12
13
14

INDEX

New names of genera, species, and varieties are printed in **heavy-faced type**, also the main reference in a series of references; synonyms are printed in *italics*.

abadima, Acræa, 128.
  Acræa pseudegina, 128.
Abantiades, 253.
Abantis, **253,** 254.
  amneris, 255.
  arctomarginata, 254.
  bicolor, 254.
  bismarcki, 254.
  efulensis, **253,** 254.
  elegantula, **253,** 254.
  ja, 254.
  leucogaster, 254.
  levubu, 255.
  lofu, 255.
  lucretia, 255.
  namaquaana, 254.
  nigeriana, 254.
  paradisea, 254.
  plerotica, 254.
  rubra, 116, 250, **253,** 255. Pl. XII, Fig. 1.
  tettensis, 253, 254.
  trimeni, 254.
  umvulensis, 254.
  venosa, 254.
  zambesiaca, 254.
  zambezina, 254.
abdera, Acræa, 129.
abesa, Euryphene, 181.
Abisara, 213.
  geryon, 213.
  intermedia, 213.
  rogersi, 213.
  rutherfordi, 213.
  rutherfordii, 213.
abraxas, Pentila, 216.
abruptaria, Boarmia, 309.
  Buzura, 309.
absolon, Euryphene, 182.
  Papilio, 182.
absolon micans, Euryphene, 182.
Aburina, 286.
  infirma, 286.
acaciaria, Boarmia, 309.
acara, Acræa, 130.
accentifera, Nephele, 301.
  Sphinx, 301.
Achæa, **282,** 283.
  albifimbria, 282.
  catocaloides, 282.
  ezea, 282.
  mania, 282.
  mormoides, 282.
  subsignata, 281.
Acherontia, 300.
  atropos, 300.
achillæna, Euryphene barce, 188.
achlys, Euryphura, 193.
  Harma, 193.
Acidalia, 312.
  amplissimata, 307.
  medjaria, 117, **312** (Fig. 6).
  ochrata, 312.
  permutans, 312.
Acidaliinæ, 312.
Acleros, 255.
  plœtzi, 255.
acontias, Acræa, 129.
Acontiinæ, 276.
Acræa, 122.
  abadima, 128.
  abdera, 129.
  acara, 130.
  acontias, 129.
  alcinoë, 121.
  alciope, 122.
  althoffi, 127.
  althoffi rubrofasciata, 127.
  atergatis, 129.
  atolmis, 129.
  aurivillii, 122.
  bakossua, 122.
  bonasia, 127.
  bonasia supponina, 127.
  cæcilia, 129.
  cepheus, 129.

egina, 126, **130.**
ehmckei, 126.
encedon, 125.
encedon alcippina, 126.
encedon fumosa, 126.
encedon infuscata, 126.
encedon lycia, 125.
fumida, 122.
infuscata, 126.
insignis, 131.
insignis siginna, 131.
jalema, 130.
jodutta, 123.
jodutta dorotheæ, 123.
leucographa, 131.
lycoa, 123.
macarina, 122.
menippe, 130.
metaprotea, 123.
nelsoni, 121.
neobule, 131.
oberthüri, 127.
oberthüri confluens, 127.
orestia, 124.
orina, 124.
parrhasia, 124.
pelasgius, 124.
peneleos, 124.
peneleos pelasgius, 124.
penelope, 124.
pentapolis, 125.
pentapolis thelestis, 125.
perenna, 129.
pharsalus, 126.
pseudegina, 128, 129.
pseudegina abadima, 128.
quirinalis, 125.
rogersi, 126.
salambo, 126.
semivitrea, 123.
servona, 123.
supponina, 127.
terpsichore, 128.
terpsichore buxtoni, 128.
thelestis, 125.
vesperalis, 125.
vinidia, 128.
viviana, 127.
  zetes, 130.
Acræidæ, 120.
acrapex, Borolia, 273.
Acromecis, 260.
  neander, 260.
Acronyctinæ, 273.
Acropteris, 318.
  erycinaria, 318.
actia, Kallimula, 150.
actisanes, Ergolis, 158.
acuta, Phytometra, 284.
  Plusia, 284.
adelica, *Caprona*, 252.
adelina, Cymothoë, **199**, 200. Pl. VIII, Figs. 9 and 10.
  Harma, 199.
aderna, Spindasis, 225. Pl. XII, Fig. 4.
  Zeritis, 225.
Adolias fulvomacula, 201.
adonina, Euphædra, 177.
  Romalæosoma, 177.
Ægeria, 331.
  nuba, 331.
Ægeriidæ, 331.
Ægocera, 271.
  amabilis, 271.
  latreillei, 271.
  latreillii, 271.
  obliqua, 272.
  rectilinea, 271.
ægretta, Problepsis, 313.
æmulatrix, *Eusemia*, 270.
  Xanthospilopteryx, 270.
æqualis, Diacrisia, 267.
æson, *Charaxes*, 206.
æthiopica, Atella phalantha, 143.
æthiops, *Cupido*, 232.
  Kharsanda, 232.
  Mycalesis safitza, 139.
  Nacaduba, 232.
  Papilio, 153.
  Salamis parhassus, 153.
africana, *Melanitis*, 131.
  Melanitis leda, 131.
afzelii, Euphædra, 176.
  Romalæosoma, 176.
Aganainæ, 268.
Agaristidæ, 270.

agatha, Neptis, 160. Pl. VI, Figs. 7 and 8.
  Papilio, 160.
agatha lativittata, Neptis, 160.
Agathodes, 329.
  musivalis, 329.
agraphis, Mycalesis, 141.
alberti, Boaris, 258.
  Parnara, 258.
albicostata, Dasychira, 297.
  Ilema, 297.
albida, Philosamia, 315.
albidus, Attacus, 315.
albifimbria, Achæa, 282.
  Ophiusa, 282.
albofasciata, Euryphura, 193.
  Euryphura plautilla, 193.
alcinoë, Acræa, 121.
  Attacus, 317.
  Bunæa, 317.
  Planema, 121.
alciope, Acræa, 122.
alcippina, Acræa encedon, 126.
alcippus, Danaida, 118.
  Danais chrysippus, 118.
  Papilio, 118.
Aletis, 311.
  helcita, 311.
algira, Noctua, 283.
  Parallelia, 283.
aliena, Sphingomorpha, 117, **285.** Pl. XIII, Fig. 14.
alinda, Eurytela, 157.
Alpenus aurantiacus, 267.
  purus, 267.
althea, Cymothoë cænis, 199.
althoffi, Acræa, 127.
althoffi rubrofasciata, Acræa, 127.
altisidora, Cymothoë, 199.
  Harma, 199.
amabilis, Ægocera, 271.
  Charilina, 271.
amanda, Argina, 269.
  Euchelia, 269.
amaranta, Diestogyna, **190,** 191.
Amata, 263.
  cerbera, 263.
  marina, 263.
Amatidæ, 262.
Amauris, 119.
  damocles, 119.
  damoclides, 120.
  hecate, 120.
  hyalites, 120.
  niavius, 119.
  psyttalea, 119.
  tartarea, 120.
amaxia, Aterica, 190.
ameliæ, Charaxes, 208.
amestris, Papilio, 147.
  Precis, 147.
  Precis octavia, 147.
Amnemopsyche, 310.
  circumdata, 310.
  flavibasis, 310.
amneris, Abantis, 255.
Amphicallia, 268.
  pactolica, 268. Pl. XIII, Fig. 2.
  pactolicus, 268.
Amphigonia, 287.
  complex, 287.
  costalis, 288.
  hyalinata, 117, **288.** Pl. XIII, Fig. 11.
  simplex, 288.
amplissimata, Acidalia, 307.
  Rhamidava, 307.
amulia, Asterope, 158.
Amyna, 289.
  octo, 289.
  punctum, 289.
Anace invaria, 264.
  perpusilla, 263.
anacompa, Ctenolita, 324.
analis, Mycalesis, 133.
Anaphe, 307.
  infracta, 307.
anatorgis, Cymothoë, 201, 202. Pl. X, Figs. 7 and 8.
Ancistrocampta chrysoglossa, 251.
Ancyloxypha producta, 260.
andremiaja, Precis, 146.
Andronymus, 260.
  neander, 260.
angasi, Caligatus, 274.
angasii, Caligatus, 274.

angolanus, Papilio, 248.
angulifascia, Cymothoë, 193, **200.** Pl. ,X Fig. 9.
angustata, Catuna, 166.
angustatum, Euomma, 166.
angustior, Euphædra preussi, 116, **175.** Pl. XI, Fig. 7.
angustus, Charaxes, 204.
  Charaxes brutus, 204.
Anoa xanthospila, 297.
anomala, Deilemera, 117, **268,** 269 (Fig. 4).
ansellica, Euxanthe, 204.
  Godartia, 204.
ansorgei, Kallima, 154.
  Melanitis, 132.
antalus, Deudorix, 222.
  Dipsas, 222.
  Sithon, 222.
Antanartia, 143.
  delius, 143.
antanossa, Cupido, 234.
  Lycæna, 234.
  Zizera, 234.
anthedon, Diadema, 157.
  Hypolimnas, 157.
Antheræa emini, 318.
antheus, Papilio, 249.
anticlea, Charaxes, 208.
  Papilio, 208.
antifaunus, Hypolycæna, 223.
  Iolus, 223.
antilope, Kallimula, 150.
  Precis, 147.
antilope cuama, Kallimula, 150.
antimachus, Papilio, 244.
Anua, 279.
  david, 280.
  hampsoni, 117, **280.**
  producta, 117, **279.**
  producta, 117, 280.
Apaustus argyrosticta, 259, 260.
  leucopygus, 255.
  neander, 260.
Aphnæus, 224.
  caffer, 224.
  crustaria, 224.
  natalensis, 224.
  orcas, 224.
apicata, Deinypena, 291.
apiciplaga, Naxia, 282.
apparata, Borolia, 273.
  Leucania, 273.
Appias, **237,** 238.
  epaphia, 238.
  phaola, 237.
  rhodope, 237.
  sabina, 238.
aralus, Cymothoë, 198.
aramis, Cymothoë, 193, **201,** 202. Pl. X, Figs. 1 and 2.
  Euryphene, 201.
archesia, Precis, 146.
arcifera, Dermaleipa, 279.
Arcte maura, 277.
Arctia divisa, 305.
Arctiidæ, 266.
Arctiinæ, 267.
arctomarginata, Abantis, 254.
argenteus, Epiolus, 253.
argia, Eronia, 243.
  Papilio, 243.
Argina, 269.
  amanda, 269.
argus, Bombyx, 316.
Argynnidinæ, 142.
Argynnis, 169.
argyrosticta, Apaustus, 259, 260.
Arrugia umbra, 221.
artaxia, Precis, 146.
asialis, Botyodes, 329.
asochis, Mycalesis, 134.
asopus, Cupido, 232.
  Lycæna, 232.
Asterope, 159.
  amulia, 159.
  boisduvali, 159.
  natalensis, 159.
  occidentalium, 159.
asterope, Hipparchia, 142.
  Ypthima, 142.
Asura, 266.
  atricraspeda, 266.
Atella, 143.
  columbina, 143.
  phalantha, 143.

- phalantha æthiopica, 143.
- Atemnora, 302.
  - westermanni, 302.
- atergatis, Acræa, 129.
- Aterica, 167.
  - *amaxia*, 190.
  - *barce*, 188.
  - *edwardsi*, 171.
  - galene, 167.
  - *tadema*, 189.
  - *theophane*, 167.
  - *zonara*, 183.
- *atolmis, Acræa*, 129.
- atossa, Diestogyna, 190.
  - *Euryphene*, 190.
- *atratus, Celænorrhinus*, 251.
- atricraspeda, Asura, 266.
- atroguttata, Leucoperina, 296.
- atropos, Acherontia, 300.
  - *Sphinx*, 300.
- *Attacus albidus*, 315.
  - *alcinoë*, 317.
  - *brachyura*, 316.
  - *epimethea*, 317, 318.
  - *fullonica*, 284.
- auga, Pentila, 216.
- aurantiaca, Diacrisia, 267.
- *aurantiacus, Alpenus*, 267.
- auricruda, Mycalesis, 134, **135.**
- *auristrigata, Melittia*, 331.
  - Trichobaptes, 331.
- *aurivillii, Acræa*, 122.
  - *Euryphene*, 185.
- *Automolis ehrmanni*, 265.
- **avakubi, Rhynchodes,** 117, **287.** Pl. XIII, Fig. 10.
- Axiocerses, 226.
  - harpax, 225, **226.**
  - *perion*, 225, 226.
- Azanus, 231.
  - mirza, 231.
- Azygophleps, 319.
  - boisduvali, 319.

- *bæticus, Cupido*, 232.
  - *Papilio*, 232.
  - Polyommatus, 232.
- *bakossua, Acræa*, 122.
- Balacra, 265.
  - *divisa*, 305.
  - ehrmanni, 265.
  - *glagoessa*, 265.
  - pulchra, 265.
- *balsaminæ, Chærocampa*, 303.
  - Hippotion, 303.
- bammakoo, Elymniopsis, 131.
  - *Melanitis*, 131.
- **bananæ, Nola,** 116, **266** (Fig. 3).
- Baoris, 258.
  - *alberti*, 258.
- *barce, Aterica*, 188.
  - Euryphene, 188.
- barce achillæna, Euryphene, 188.
- bartteloti, Hypolimnas, 116, **155,** 156.
- **bartteloti obliterata, Hypolimnas,** 116, **156.** Pl. VI, Fig. 5.
- Basiothia, 302.
  - charis, 302.
- *batangæ, Parnara*, 258.
  - Platylesches, 258.
- batesi, Xanthospilopteryx, 270.
  - *Xynthospilopteryx*, 270.
- batikeli, Deudorix, 221, 222.
- **batikelides, Deudorix,** 116, **221,** 222 (Fig. 1).
- baumanni, Mycalesis, **137,** 138, 140.
- *bebra, Charaxes*, 212.
  - *Charaxes lichas*, 212.
  - Philognoma lichas, 212.
- beckeri, Cymothoë, 194, 195.
- *Belenois welwitschii*, 239.
- *benitensis, Grammodes*, 283.
  - Parachalciope, 283.
- bernice, Mylothris, 237.
- biafra, Neptis, 162, **163.** Pl. VIII, Fig. 3.
- *biafra continuata, Neptis*, 162.
- bicolor, Abantis, 254.
- *bicoloraria, Megalopalpus*, 218, 220.
- Bicyclus, 132.
  - hewitsoni, 132.
  - hewitsoni nanodes, 132.
  - iccius, 133.
  - medontias, 116, 132, 133.
  - **medontias obsoletus,** 116, **132.** Pl. VII, Fig. 1.
  - sebetus, 133.

biguttata, Phryganodes, 328.
bimacula, Pentila, 215.
Telipna, 215.
bipartita, Nephele, 301.
bipunctalis, Pachyzancla, 331.
Phalæna, 331.
bipunctata, Sapelia, 117, **295.** Pl. XIV, Figs. 3 and 4.
bipunctatus, Charaxes, 207.
bisinuata, Terias, 241.
Terias senegalensis, 241.
bismarcki, Abantis, 254.
bivittata, Syntomis, 263.
Trichæta, 263.
bixæ, Ismene, 262.
Papilio, 262.
Rhopalocampta, 262.
Bizone delicata, 266.
blassi, Cymothoë, 194.
boadicea, Celænorrhinus, 251.
Pterygospidea, 251.
Boarmia, **309,** 310.
abruptaria, 309.
acaciaria, 309.
Boarmiinæ, 307.
boisduvali, Asterope, 159.
Azygophleps, 319.
Crenis, 159.
boisduvalianus, Papilio, 244.
boisduvallii, Zeuzera, 319.
bolengensis, Tolna, 117, 280. Pl. XIII, Fig. 9.
Bombyx argus, 316.
maculosa, 267.
vaillantina, 277.
bonasia, Acræa, 127.
Papilio, 127.
bonasia supponina, Acræa, 127.
bonjongalis, Eudioptis, 330.
Glyphodes, 330.
borbonica, Hesperia, 257.
Parnara, 257.
Borolia, 273.
acrapex, 273.
apparata, 273.
Botyodes, 329.
asialis, 329.
Botys cancellalis, 330.
pæonalis, 328.
sericea, 329.
brachyura, Attacus, 316.
Eudæmonia, 117, 316.
brachyura minor, Eudæmonia, 117, **316.**
brenda, Terias, 240.
brenda maculata, Terias, 241.
brigitta, Papilio, 242.
Terias, 242.
Brithys, 273.
pancratii, 273.
brizoalis, Cirrhochrista, 326.
bromius, Papilio, 246.
brutus, Charaxes, 204.
Papilio, 204.
brutus angustus, Charaxes, 204.
bule, Pardaleodes, 259.
Bunæa, 317.
alcinoë, 317.
buxtoni, Acræa terpsichore, 128.
Buzura, 309.
abruptaria, 309.
Byblia, 158.
crameri, 158.
ilithya, 158.
vulgaris U, 158.

cachrusalis, Elyra, 290.
cacta, Papilio, 153.
Salamis, 153.
cæcilia, Acræa, 129.
Papilio, 129.
Cænides, 261.
cænira, 261.
cylinda, 261.
dacena, 261.
cænira, Cænides, 261.
Hesperia, 261.
Hidari, 261.
Pamphila, 261.
cænis, Cymothoë, 116, **198,** 199, 200.
Papilio, 198.
cænis althea, Cymothoë, 199.
cænis conformis, Cymothoë, 198. Pl. IX, Fig. 3.
cænis euthalioides, Cymothoë, 199.
cænis rubida, Cymothoë, 116, 198,

199. Pl. IX, Fig. 7.

caffer, Aphnæus, 224.

calescens, Heterospila, 290.

Caligatus, 274.
- angasi, 274.
- *angasii*, 274.

Callimorphinæ, 268.

Callocossus, 318.
- elegans, 319.
- **langi,** 117, **318.** Pl. XIV, Fig. 8.

calpis, Hesperia, 261.
- *Pamphila*, 261.

calypso, Papilio, 239.
- Pieris, 239.

camarensis, Diestogyna, 189.
- *Euryphene*, 189.

Cambogia, 312.

camerunica, Jana, **303,** 304.

camillus, Cyrestis, 159.
- *Papilio*, 159.

cancellalis, Botys, 330.
- Sameodes, 330.

candiope, Charaxes, 209.
- *Nymphalis*, 209.

capella, Cymothoë, 198. Pl. VIII, Fig. 6.

capellides, Cymothoë, 116, **198.** Pl. VIII, Fig. 5.

Caprona, 252.
- *adelica*, 252.
- pillaana, 252.

carana, Castalius, 231.
- *Cupido*, 231.
- *Lycæna*, 231.

carbo, Cobalus, 258.

cardui, Papilio, 143.
- Pyrameis, 143.

caritalis, Pagyda, 327.

carnea, Meganaclia, 263.

Carpostalagma, 269.
- viridis, 269.

carshena, Euryphene, 181.

Caryatis viridis, 269.

Castalius, 231.
- carana, 231.
- isis, 231.
- margaritaceus, 231.

castanea, Euryphene, 186.

castor, Charaxes, 205.
- *Papilio*, 205.

Catacroptera, 152.
- cloanthe, **152,** 153.
- cloanthe ligata, 152, 153.
- obscurior, 153.

Catarctia, 305.
- divisa, 305.

catenata, Obrussa, 308.

catocalina, Heliophisma, 280.
- *Ophiodes*, 280.

Catocalinæ, 277.

catocaloides, Achæa, 282.

catochrous, Charaxes, 209.

Catopsilia, 243.
- florella, 243.

Catuna, 166.
- angustata, 166.
- crithea, 166.
- oberthüri, 166.

cebrene, Junonia, 145.
- *Precis*, 145.

Celænorrhinus, 250.
- *atratus*, 251.
- boadicea, 251.
- *chrysoglossa*, 251.
- chrysoglossus, 251.
- galenus, **250,** 251.
- rutilans, 251.

celerio, Chærocampa, 302.
- Hippotion, 302.
- *Sphinx*, 302.

Centroctena, 303.
- rutherfordi, 303.

cepheus, Acræa, 129.
- *Papilio*, 129.

Ceratocampidæ, 317.

Ceratrichia, 259.
- flava, 260.
- ialemia, 259.
- nothus, 259.
- phocion, 259.
- wollastoni, 260.

cerbera, Amata, 263.
- *Sphinx*, 263.
- *Syntomis*, 263.

ceres, Euphædra, 168, 171.
- *Terias*, 242.
- Terias floricola, 242.

ceryne, Junonia, 149.
  Precis, 146, **149.**
  Salamis, 149.
chalcis, Euryphura, 193.
  Harma, 193.
chapinaria, Pseudoterpna. 117, **314.** Pl. XIII, Fig. 19.
chapini, Metarctia, 116, **264.** Pl. XIII, Fig. 4.
  Mycalesis, 116, **140.** Pl. VII, Fig. 9.
  Spindasis, 116, **225.** Pl. XII, Fig. 6.
Chapra, 257.
  mathias, 257.
Charaxes, 114, **204.**
  æson, 206.
  ameliæ, 208.
  angustus, 204.
  anticlea, 208.
  bebra, 212.
  bipunctatus, 207.
  brutus, 204.
  brutus angustus, 204.
  candiope, 209.
  castor, 205.
  catochrous, 209.
  cynthia, 206.
  dilutus, 210.
  doubledayi, **210,** 211.
  epijasius, 204.
  etesipe, 206.
  etheocles, **208,** 209.
  etheocles hollandi, 209.
  etheocles picta, 209.
  eudoxus, 205.
  eudoxus mechowi, 205.
  eupale, 209.
  fulvescens, 211.
  godarti, 205.
  hadrianus, 208.
  hildebrandti, 208.
  imperialis, 207.
  kahldeni, 209.
  laodice, 210.
  lichas bebra, 212.
  lucretius, 207.
  mechowi, 205.
  mycerina, **210,** 211.
  nichetes, 210.
  nobilis, 208.
  numenes, 207.
  ogovensis, 210.
  paphianus, 212.
  pollux, 205.
  porthos, 210.
  protoclea, 116, **206.**
  protoclea marginepunctata, 116, **206.**
  smaragdalis, 207.
  tiridates, 207.
  vologeses, 211.
  zelica, 210.
  zingha, 212.
charcedonius, Papilio, 249.
Charidea, 324.
  hypparchus, 324.
  semiaurata, 324.
Charilina, 271.
  amabilis, 271.
charis, Basiothia, 302.
  Chærocampa, 302.
charita, Plastingia, 260.
chelys, Papilio, 132.
  Gnophodes, 132.
Chionæma, 266.
  delicata, 266.
chloëropis, Euryphene, 188.
chlorea, Noctua, 285.
  Phalæna, 285.
  Sphingomorpha, 285.
chloris, Mylothris, 236.
  Papilio, 236.
Chærocampa balsaminæ, 303.
  celerio, 302.
  charis, 302.
Chærotriche orestes, 297.
chorimene, Precis, 146, **147.**
  Vanessa, 147.
chrysippus, Danaida, 118.
  Danais, 118.
  Papilio, 118.
chrysippus alcippus, Danais, 118.
chrysoglossa, Ancistrocampta, 251.
  Celænorrhinus, 251.
chrysoglossus, Celænorrhinus, 251.

Chrysophanus perion, 226.
Chrysopoloma, 322.
  inspersa, 322.
  nubila, 117, **322** (Fig. 7).
  rudis, 322.
Chrysopolomidæ, 322.
cinerea, Megadrepana, 320.
circumdata, Amnemopsyche, 310.
  Girpa, 310.
Cirina, 317.
  similis, 317.
Cirphis, 272.
  polyrabda, 273.
  prominens, 272.
Cirrhochrista, 326.
  brizoalis, 326.
  saltusalis, 326.
cissalma, Hypolimnas, 155.
clarensis, Pentila, 215. Pl. XII, Figs. 11 and 12.
clarki, Pseudacræa, 165.
clarki egina, Pseudacræa, 165.
clathrata, Heteronygmia, 299.
clelia, Junonia, 144, 146.
  Papilio, 144.
  Precis, 144, 146.
cloanthe, Catacroptera, **152,** 153.
  Papilio, 152.
cloanthe ligata, Catacroptera, 152, 153.
clœtensi, Pentila, 216. Pl. XII, Fig. 9.
coanza, Hesperia, 259.
Cobalus carbo, 258.
coccinata, Cymothoë, 201.
  Harma, 201.
Cocytodes, 277.
  maura, 277.
cocytusalis, Euglyphis, 328.
  Filodes, 328.
cœlestina, Kallimula, 150.
Cœlonia, 300.
  fulvinotata, 300.
cœnobita, Papilio, 166.
  Pseudoneptis, 166.
cœrulescens, Euphædra, 175, 176, 178, 179.
colmanti, Cymothoë, 195.
columbina, Atella, 143.
  Papilio, 143.
comma, Nephele, 300.
complex, Amphigonia, 287.
  Episparis, 287.
confluens, Acræa oberthüri, 127.
conformis, Cymothoë cænis, 198. Pl. IX, Fig. 3.
confusa, Cymothoë, 195.
congoënsis, Leocyma, 117, **277.** Pl. XIII, Fig. 13.
congolensis, Euryphene, 185.
consanguinea, Planema, 121.
continua, Pitthea, 310.
continuata, Neptis, 162.
  Neptis biafra, 162.
convolvuli, Herse, 299.
  Protoparce, 299.
  Sphinx, 299.
Copaxa gemmifera, 317.
coprates, Euphædra eleus, 171.
  Romalæosoma, 171.
Cossidæ, 318.
costalis, Amphigonia, 288.
crameri, Byblia, 158.
Crenis, 159.
  boisduvali, 159.
  madagascariensis, 159.
  natalensis, 159.
  occidentalium, 159.
creona, Papilio, 238.
  Pieris, 238.
cretacea, Goniloba, 256.
  Hypoleucis, 256.
crithea, Catuna, 166.
  Papilio, 166.
Crocidophora testulalis, 331.
crocicollis, Liparis, 296.
crœsaria, Melinoessa, 308.
crossleyi, Euxanthe, 204.
  Godartia, 204.
crowleyi, Euphædra, 169.
crucifera, Dasychira, 297.
  Œcura, 297.
crustaria, Aphnæus, 224.
  Spindasis, 224.
Ctenocompa hilda, 299.
Ctenogyna, **305,** 306.
  medjensis, 117, **305.** Pl. XIV, Fig. 10.

  natalensis, 306.
  ogovensis, 306.
  vilis, 306.
Ctenolita, 324.
  anacompa, 324.
cuama, Kallimula antilope, 150.
Cupidesthes, 227.
  thyrsis, 227.
Cupido, 232.
  æthiops, 232.
  antanossa, 234.
  asopus, 232.
  bæticus, 232.
  carana, 231.
  falkensteini, 230.
  gaika, 234.
  heritsia, 230.
  hippocrates, 233.
  isis, 231.
  lysimon, 234.
  malathana, 232.
  micylus togara, 233.
  mirza, 231.
  ornatus, 234.
  osiris, 232.
  parsimon, 233.
  patricia, 233.
  phlyaria, 230.
  plurilimbata, 234.
  punctatus, 234.
  telicanus plinius, 231.
Cupidopsis, 233.
  hippocrates, 233.
  jobates, 233.
curvilinea, Diacrisia, 267.
  Spilosoma, 267.
cyanea, Euphædra, 116, **178,** 179. Pl. IX, Figs. 1 and 2.
cyara, Lycæna, 230.
  Phlyaria, 230.
cyclades, Cymothoë, **195,** 201. Pl. VII, Fig. 6.
  Harma, 195.
Cyclopides, 256.
  unicolor, 256.
Cyligramma, 277.
  latona, 277.
  magus, 278.
cylinda, Cænides, 261.
  Hesperia, 261.
cymodoce, Kallima, 154.
Cymothoë, 193.
  adelina, **199,** 200. Pl. VIII, Figs. 9 and 10.
  altisidora, 199.
  anatorgis, 201, 202. Pl. X, Figs. 7 and 8.
  angulifascia, 193, **200.** Pl. X, Fig. 9.
  aralus, 198.
  aramis, 193, **201,** 202. Pl. X, Figs. 1 and 2.
  beckeri, 194, 195.
  blassi, 194.
  cænis, 116, **198,** 199, 200.
  cænis althea, 199.
  cænis conformis, 198. Pl. IX, Fig. 3.
  cænis euthalioides, 199.
  cænis rubida, 116, 198, **199.** Pl. IX, Fig. 7.
  capella, 198. Pl. VIII, Fig. 6.
  capellides, 116, **198.** Pl. VIII, Fig. 5.
  coccinata, 201.
  colmanti, 195.
  confusa, 195.
  cyclades, **195,** 201. Pl. VII, Fig. 6.
  diphyia, **195,** 196. Pl. VI, Fig. 6.
  ehmckei, 198.
  fumana, 196.
  herminia, 116, **196.** Pl. VIII, Figs. 1 and 4.
  herminia poënsis, 116, **196.** Pl. VIII, Fig. 2.
  hewitsoni, 197.
  jodutta, 198.
  johnstoni, 197.
  langi, 116, **197.** Pl. VIII, Figs. 7 and 8.
  lurida, 201.
  ogova, 116, 201, **202.** Pl. X, Figs. 3 and 4.
  ogova rubescens, 116, **203.**
  Reginæ-Elizabethæ, 116, **201.** Pl. X, Figs. 5 and 6.
  reinholdi, 194.
  reinholdii, 194.

  sangaris, **200,** 201, 202, 203.
  staudingeri, 197.
  theobene, 194.
  theodosia, **194,** 196.
  weymeri, 197.
Cynandra, 166.
  opis, 166.
cynorta, Papilio, 244.
cynthia, Charaxes, 206.
cypræafila mechowiana, Papilio, 245.
Cyrestis, 159.
  camillus, 159.
cyriades, Harma, 198.

dacela, Cænides, 261.
  Hesperia, 261.
dædalus, Hamanumida, 167.
  Papilio, 167.
dædalus meleagris, Hamanumida, 167.
damocles, Amauris, 119.
  Papilio, 119.
damoclides, Amauris, 120.
Danaida, 118.
  alcippus, 118.
  chrysippus, 118.
  petiverana, 119.
Danaidæ, 118.
Danais, 118.
  chrysippus, 118.
  chrysippus alcippus, 118.
  limniace, 119.
  petiverana, 119.
Danaus, 118.
dardanus, Papilio, 244.
Dasychira, 297.
  albicostata, 297.
  crucifera, 297.
  gnava, 297.
  muscosa, 297.
david, Anua, 280.
  Minucia, 280.
decius, Palla, 211.
  Papilio, 211.
Deilemera, **268,** 269.
  anomala, 117, **268,** 269 (Fig. 4).
  fallax, 268.
  leuconoë, 268.
Deilephila osiris, 302.
Deinypena, 291.
  apicata, 291.
  fulvida, 117, **292.** Pl. XIII, Fig. 16.
  geometroides, 291.
  lacista, 291.
  lathetica, 291.
  margine-punctata, 291.
  morosa, 117, **291.** Pl. XIII, Fig. 18.
  morosa pallidior, 117, **292.**
  multilineata, 117, **292.** Pl. XIV, Fig. 5.
  obscura, 117, **294.** Pl. XIV, Fig. 11.
  transversata, 117, **293.** Pl. XIII, Fig. 17.
  triangularis, 291.
delicata, Bizone, 266.
  Chionæma, 266.
delius, Antanartia, 143.
  Hypanartia, 143.
  Papilio, 143.
demodocus, Papilio, 246.
demodocus nubila, Papilio, 246.
demoleus, Papilio, 246.
Dermaleipa, 278.
  arcifera, 279.
  nubilata, 117, **278.** Pl. XIII, Fig. 15.
  parallelipipeda, 279.
desjardinsi, Terias, 242.
Desmia sericea, 329.
desolata, Mycalesis, 139.
Deudorix, 221.
  antalus, 222.
  batikeli, 221, 222.
  batikelides, 116, **221,** 222 (Fig. 1).
  eleala, 221.
  elealodes, 221.
dewitzi, Planema, 121.
Diacrisia, 267.
  æqualis, 267.
  aurantiaca, 267.
  curvilinea, 267.
  lutescens, 267.
  maculosa, 267.
Diadema anthedon, 157.
  mechowi, 155.

monteironis, 155.
Dichora, 213.
labdaca 212.
Diestogyna, 189.
amaranta, **190,** 191.
atossa, 190.
camarensis, 189.
doriclea, 190.
doriclea infusca, 190.
gambiæ, 190.
goniogramma, 189.
kahli, 116, **191.** Pl. XII, Fig. 13.
mawamba, **189,** 191.
melanops, 189.
rotundata, 116, **191.** Pl. XII, Fig. 14.
saphirina, 189.
tadema, **189,** 191.
umbrina, 192.
digramma, Metaleptina, 276.
Westermannia, 276.
dilutus, Charaxes, 210.
diphyia, Cymothoë, **195,** 196. Pl. VI, Fig. 6.
Dipsas antalus, 222.
divisa, Arctia, 305.
Balacra, 305.
Catarctia, 305.
divitiosa, Ophideres, 285.
doleta, Ypthima, 142.
donovani, Mylothris spica, 116, 117, **236,** 237.
doriclea, Diestogyna, 190.
doriclea infusca, Diestogyna, 190.
dorotheæ, Acræa jodutta, 123.
doubledayi, Charaxes, **210,** 211.
Drepanulidæ, 320.
dromus, Hesperia, 255.
Pyrgus, 255.
dryope, Eurytela, 157.
Papilio, 157.
dubia, Hypolimnas, 156.
Hypolycæna, **223,** 224.
Mycalesis, 137.
dubius, Papilio, 156.

Eagris, 252.
lucetia, 252.
eberti, Euphædra, 177.
ectargyralis, Glyphodes, 330.
edipus, Papilio, 259.
Pardaleodes, 259.
edwardsi, Aterica, 171.
Euphædra, 171.
efulensis, Abantis, **253,** 254.
Rhynchodes, 117, **287.**
egina, Acræa, 126, **130.**
Papilio, 130.
Pseudacræa clarki, 165.
Egybolis, 277.
vaillantina, 277.
ehmckei, Acræa, 126.
Cymothoë, 198.
ehrmanni, Automolis, 265.
Balacra, 265.
Elæodes, 284.
virescens, 284.
eleala, Deudorix, 221.
elealodes, Deudorix, 221.
elegans, Callocossus, 319.
elegantula, Abantis, **253,** 254.
Sapæa, 253.
eleus, Ephædra, **169,** 170.
Papilio, 169.
eleus coprates, Euphædra, 171.
eleus hybrida, Euphædra, 170.
eleus hybridus, Euphædra, 170.
eliasis, Henotesia, 142.
Mycalesis, 142.
elongata, Planema, 121.
elorea, Oboronia, 235.
Elymniinæ, 131.
Elymniopsis, 131.
bammakoo, 131.
phegea, 131.
Elyra, 290.
cachrusalis, 290.
gabunalis, 290.
phlegeusalis, 290.
emini, Antheræa, 318.
Nudaurelia, 318.
encedon, Acræa, 125.
Papilio, 125.
encedon alcippina, Acræa, 126.
encedon fumosa, Acræa, 126.
encedon infuscata, Acræa, 126.

encedon lycia, Acræa, 125.
Enmonodia, 278.
  occidentalis, 278.
enotrea, Ergolis, 158.
  Papilio, 158.
entebiæ, Euryphene, 182.
Entomogramma, 278.
  pardus, 278.
epæa, Papilio, 120.
  Planema, 120.
epaphia, Appias, 238.
  Papilio, 238.
epijasius, Charaxes, 204.
epimethea, Attacus, 317, 318.
  Imbrasia, 317.
Epiolus argenteus, 253.
epiprotea, Planema, 121.
Episparis complex, 287.
  simplex, 288.
Epitola, **217**, 218.
  langi, 116, **217.** Pl. XII, Fig. 10.
  mangoënsis, 218.
Epitolinæ, 217.
eranga, Temnora, 301.
Erastriinæ, 289.
Ercheia, 281.
  multilinea, 282.
  periploca, 281.
  subsignata, **281,** 282.
Erebus magus, 278.
erebusalis, Phryganodes, 328.
Eremobia virescens, 284.
Ergolis, 158.
  actisanes, 158.
  enotrea, 158.
  murina, 158.
  pagenstecheri, 158.
Eronia, 243.
  argia, 243.
  pharis, 243.
  thalassina, 243.
erubescens, Metarctia, 264.
erycinaria, Acropteris, 318.
  Micronia, 318.
eson, Hippotion, 303.
  Sphinx, 303.
Estigmene, 267.
  pura, 267.
etesipe, Charaxes, 206.
  Nymphalis, 206.
etheocles, Charaxes, **208,** 209.
  Papilio, 208.
etheocles hollandi, Charaxes, 209.
etheocles picta, Charaxes, 209.
ethosea, Mesoxantha, 158.
  Papilio, 158.
ethyra, Precis, 147.
  Salamis, 147.
Eubyjodonta, 309.
Euchelia amanda, 269.
Euchloron, 302.
  megæra, 302.
  megæra megæra, 302.
Euchromia, 265.
  guineënsis, 266.
  lethe, 265.
  semiaurata, 324.
  sperchia, 266.
Eudæmonia, 316.
  brachyura, 117, 316.
  brachyura minor, 117, **316.**
  uroarge, 316.
Eudioptis bonjongalis, 330.
  traducalis, 327.
eudoxus, Charaxes, 205.
  Papilio, 205.
eudoxus mechowi, Charaxes, 205.
Euglyphis cocytusalis, 328.
Eunicinæ, 159.
Euomma angustatum, 166.
eupale, Charaxes, 209.
  Papilio, 209.
Euphædra, 168.
  adonina, 177.
  afzelii, 176.
  ceres, 168, 171.
  cœrulescens, 175, 176, 178, 179.
  crowleyi, 169.
  cyanea, 116, **178,** 179. Pl. IX, Figs. 1 and 2.
  eberti, 177.
  edwardsi, 171.
  eleus, **169,** 170.
  eleus coprates, 171.
  eleus hybrida, 170.
  eleus hybridus, 171.

  - gausape, **177,** 178, 179.
  - imitans, 169. Pl. VII, Fig. 2.
  - **inanoides,** 116, **175.** Pl. XI, Figs. 2 and 3.
  - inanum, 175, 176.
  - karschi, 179.
  - losinga, 180.
  - medon, 116, 179, 180.
  - **medon innotata,** 116, **179.** Pl. IX, Fig. 6.
  - perseis, 169.
  - phaëthusa, 176.
  - preussi, 116, 168, **171,** 172, 173, 174, 175.
  - **preussi angustior,** 116, **175.** Pl. XI, Fig. 7.
  - **preussi fulvofasciata,** 116, **174.** Pl. XI, Fig. 6.
  - **preussi latefasciata,** 116, **175.** Pl. XI, Fig. 8.
  - preussi njami, 172, 173.
  - preussi njamnjami, 171,. 173, 174, 175.
  - **preussi notata,** 116, **173.** Pl. XI, Fig. 1.
  - **preussi subviridis,** 116, **174.** Pl. XI, Fig. 4.
  - ravola, 176.
  - rezia, 177.
  - **rezioides,** 116, **177.** Pl. XI, Fig. 5.
  - ruspina, 169.
  - spatiosa, 180.
  - themis, 177.
  - vetusta, 177.
  - xypete, 116, 168, 178.
  - **xypete maxima,** 116, **178.**
- Euptera, 169, **203.**
  - pluto, 203.
- *eurinome, Euxanthe,* 204.
- *Euriphene infusca,* 190.
- eurodoce, Kallimula, 150.
- eurymas, Jana, 303.
- Euryphene, 180.
  - abesa, 181.
  - absolon, 182.
  - absolon micans, 182.
  - *aramis,* 201.
  - *atossa,* 190.
  - *aurivillii,* 185.
  - barce, 188.
  - barce achillæna, 188.
  - *camarensis,* 189.
  - carshena, 181.
  - castanea, 186.
  - chloëropis, 188.
  - congolensis, 185.
  - entebiæ, 182.
  - flaminia, 187.
  - fulgurata, 185. Pl. X, Fig. 11.
  - *gambiæ,* 190.
  - iturina, 185.
  - lætitia, 186.
  - *lesbonax,* 188.
  - **lucasi,** 116, **183.** Pl. IX, Figs. 4 and 5.
  - luteola, 188.
  - mandinga, 184.
  - mardania, 187.
  - maximiniana, 187. Pl. VII, Fig. 10.
  - oxione, 184.
  - partita, 185.
  - phantasia, 187.
  - phranza, 185.
  - plistonax, 187.
  - *pluto,* 203.
  - rubrocostata, 188.
  - severini, 186.
  - sophus, 186.
  - sophus phreone, 187.
  - subtentyris, 181.
  - tentyris, 181.
  - umbrina, 192.
  - zonara, 182, **183.**
- Euryphura, 192.
  - achlys, 193.
  - *albofasciata,* 193.
  - chalcis, 193.
  - plautilla albofasciata, 193.
- Eurytela, 157.
  - alinda, 157.
  - dryope, 157.
  - hiarbas, 157.
- Eurytelinæ, 157.
- *Eusemia æmulatrix,* 270.
  - *poggei,* 270.
- Eutelia, 274.

nigricans, 117, **274.** Pl. XIII, Fig. 8.
subrubens, 274.
Euteliinæ, 274.
euthalioides, Cymothoë cænis, 199.
Euxanthe, 204.
ansellica, 204.
crossleyi, 204.
eurinome, 204.
trajanus, 204.
evenus, Mycalesis, 139.
Mycalesis safitza, 139.
Everes, 233.
micylus, 233.
togara, 233.
evippe, Papilio, 240.
Teracolus, 240.
exaleuca, Neptidomima, 116, **164**.
Neptis, 116, 164.
eximia, Methorasa, 280.
Tolna, 280.
ezea, Achæa, 282.
Phalæna, 282.

falcata, Philognoma, 212.
falkensteini, Cupido, 230.
Plebeius, 230.
Uranothauma, 230.
fallax, Deilemera, 268.
Nyctemera, 268.
Spindasis, 225.
Zeritis, 225.
famula, Pitthea, 310.
famulita, Pitthea, 117, **310.** Pl. XIII, Fig. 3.
fan, Osmodes, 259.
Pardaleodes, 259.
Filodes, 328.
cocytusalis, 328.
flabellaria, Olapa, 296.
Phalæna, 296.
flaminia, Euryphene, 187.
flava, Ceratrichia, 260.
Oboronia ornata, 116, **235.**
flavibasis, Amnemopsyche, 310.
Hylemera, 310.
flaviventris, Xanthospilopteryx, 270.
flesus, Nisoniades, 251.
Papilio, 251.
Tagiades, 251.
florella, Catopsilia, 243.
Papilio, 243.
florestan, Hesperia, 262.
Ismene, 262.
floricola, Terias, 242.
floricola ceres, Terias, 242.
forestan, Papilio, 262.
Rhopalocampta, 262.
frugalis, Mocis, 283.
Noctua, 283.
fulgurata, Euryphene, 185. Pl. X, Fig. 11.
fullonica, Attacus, 284.
Ophideres, 284.
Phalæna, 284.
fulvescens, Charaxes, 211.
Palla, 211.
fulvida, Deinypena, 117, **292.** Pl. XIII, Fig. 16.
fulvinotata, Cœlonia, 300.
Protoparce, 300.
fulvofasciata, Euphædra preussi, 116, **174.** Pl. XI, Fig. 6.
fulvomacula, Adolias, 201.
fumana, Cymothoë, 196.
fumida, Acræa, 122.
fumosa, Acræa encedon, 126.
Temnora, 301.
Zonilia, 301.
fumosus, Papilio ridleyanus, 116, **247.** Pl. VI, Fig. 4.
funebris, Nephele, 301.
Nephele funebris, 301.
Sphinx, 301.
funebris funebris, Nephele, 301.
funebris maculosa, Nephele, 301.
Furcivena, 326.
fuscata, Precis stygia, 116, 147, **148,** 149. Pl. VII, Fig. 5.
fuscivena, Stracena, 295.

gabunalis, Elyra, 290.
gabunica, Jana, 304.
gaika, Cupido, 234.
Lycæna, 234.
Zizera, 234.

galena, Hesperia, 250.
galene, Aterica, 167.
  Papilio, 167.
galenus, Celænorrhinus, **250**, 251.
  Hesperia, 250.
  Plesioneura, 250.
gallienus, Papilio, 245.
gambiæ, Diestogyna, 190.
  Euryphene, 190.
gausape, Euphædra, **177**, 178, 179.
  Romalæosoma, 177.
gemmifera, Copaxa, 317.
  Tagoropsis, 317.
Geometra hesparia, 272.
Geometridæ, 114, **307**, 314, 315.
Geometrinæ, 314.
geometroides, Deinypena, 291.
Gerydus, 218.
geryon, Abisara, 213.
getula, Philosamia, 316.
Girpa circumdata, 310.
gladiatoria, Schausia, 272.
glagoessa, Balacra, 265.
  Pseudapiconoma, 265.
Glyphodes, 329.
  bonjongalis, 330.
  ectargyralis, 330.
  ocellata, 330.
  sericea, 329.
  sinuata, 330.
gnava, Dasychira, 297.
Gnophodes, 132.
  chelys, 132.
  parmeno, 132.
godarti, Charaxes, 205.
Godartia ansellica, 204.
  crossleyi, 204.
  trajanus, 204.
golo, Mycalesis, 136, 137.
golo violascens, Mycalesis, 137.
Gonanticlea, **311,** 312.
  langaria, 117, **311.** Pl. XIV, Fig. 9.
gonessa, Hesperia, 256.
Goniloba cretacea, 256.
Gonimbrasia obscura, 317.
goniogramma, Diestogyna, 189.
Gonopterinæ, 275.
gottbergi, Pseudacræa, 165.
Grammodes, 283.
  benitensis, 283.
  stolida, 283.
grandiplaga, Phasicnecus, 117, **304.** Pl. XIV, Fig. 14.
gregorii, Precis, 148.
  Precis stygia, 147, **148,** 149. Pl. VII, Fig. 4.
grisea, Hyda, 250.
  Pterygospidea, 250.
  Sarangesa, 250.
gruenbergi, Xanthospilopteryx, 271.
guineënsis, Euchromia, 266.
  Zygæna, 266.

Hadeninæ, 272.
hadrianus, Charaxes, 208.
hæmatica, Metarctia, 264.
Hamanumida, 167.
  dædalus, 167.
  dædalus meleagris, 167.
  meleagris, 167.
hampsoni, Anua, 117, **280.**
hapale, Terias, 242.
Harma achlys, 193.
  adelina, 199.
  altisidora, 199.
  chalcis, 193.
  coccinata, 201.
  cyclades, 195.
  cyriades, 198.
  jodutta, 198.
  ogova, 202.
  reinholdi, 194.
  theobene, 194.
  uselda, 200.
harpax, Axiocerses, 225, **226.**
  Papilio, 226.
harpyia, Kallimula, 149, **152.**
  Kallimula pelarga, 150.
  Papilio, 152.
  Precis, 152.
hatita, Hypolycæna, 223.
hecatæa, Lachnoptera, 142.
hecate, Amauris, 120.
helcita, Aletis, 311.
  Papilio, 311.
helcitoides, Phægorista, 270.

Heliophisma, 280.
  catocalina, 280.
Henotesia, 141.
  eliasis, 142.
  peitho, 142.
  perspicua, 141.
  phæa, 141.
Hepialidæ, 253.
Herculia, 326.
heritsia, Cupido, 230.
  Lycæna, 230.
  Phlyaria, 230.
herminia, Cymothoë, 116, **196**. Pl. VIII, Fig. 1 and 4.
herminia poënsis, Cymothoë, 116, **196**. Pl. VIII, Fig. 2.
Herse, 299.
  convolvuli, 299.
Hespagarista tigrina, 271.
hesparia, Geometra, 272.
  Massagidia, 272.
Hesperia, 255.
  borbonica, 257.
  cœnira, 261.
  calpis, 261.
  coanza, 259.
  cylinda, 261.
  dacela, 261.
  dromus, 255.
  florestan, 262.
  galena, 250.
  galenus, 250.
  gonessa, 256.
  hippocrates, 233.
  laronia, 256.
  mathias, 257.
  plinius, 231.
  plœtzi, 255.
  pulvina, 258.
  unicolor, 262.
Hesperiidæ, 109, 112, 113, 114, **249**.
Hesperiinæ, 250.
hesperus, Papilio, 245.
Heterocera, 109, **262.**
heterogyna, Stethotrix, 252.
Heteronygmia clathrata, 299.
Heterospila, 289.
  calescens, 290.
  rubida, 117, **289.** Pl. XIII, Fig. 12.
hewitsoni, Bicyclus, 132.
  Cymothoë, 197.
hewitsoni nanodes, Bicyclus, 132.
hiarbas, Eurytela, 157.
  Papilio, 157.
Hidari, 261.
  cœnira, 261.
hilda, Ctenocompa, 299.
hildebrandti, Charaxes, 208.
  Nymphalis, 208.
hildoides, Lælia, 117, **298** (Fig. 5).
Hipparchia asterope, 142.
hippocoön, Papilio, 244.
hippocrates, Cupido, 233.
  Cupidopsis, 233.
  Hesperia, 233.
Hippotion, 302.
  balsaminæ, 303.
  celerio, 302.
  eson, 303.
  osiris, 302.
hobleyi, Pseudacræa, 165.
hollandi, Charaxes etheocles, 209.
  Libyoclanis, 300.
homeyeri, Hypolycæna, 222.
  Oxylides, 222. Pl. XII, Fig. 5.
hostilia warburgi, Pseudacræa, 164.
hyalinata, Amphigonia, 117, **288.** Pl. XIII, Fig. 11.
hyalites, Amauris, 120.
hybrida, Euphædra eleus, 170.
hybridus, Euphædra eleus, 171.
Hyda, 250.
  grisea, 250.
  micacea, 250.
Hydrocampinæ, 327.
Hylemera flavibasis, 310.
Hymenia recurvalis, 327.
Hypanartia delius, 143.
Hypena, 291.
Hypeninæ, 290.
Hyphenophora, 307.
  palumbata, 307.
  perlimbata, 307.
Hypochroma ruginaria, 314.
Hypochrosis, 309.
  massagaria, 309.

Hypoleucis, 256.
  cretacea, 256.
Hypolimnas, 154.
  anthedon, 157.
  bartteloti, 116, **155,** 156.
  bartteloti obliterata, 116, **156.** Pl. VI, Fig. 5.
  cissalma, 155.
  dubia, 156.
  inaria, 154.
  mechowi, 155.
  misippus,154.
  monteironis, 155.
  salmacis, 154.
Hypolycæna, 223.
  antifaunus, 223.
  dubia, **223,** 224.
  hatita, 223.
  homeyeri, 222.
  lebona, 223, 224.
  liara, 224.
hypparchus, Charidea, 324.
  Sphinx, 324.
Hyreus virgo, 230.

ialemia, Ceratrichia, 259.
iccius, Bicyclus, 133.
  Idiomorphus, 133.
  Mycalesis, 133.
Idiomorphus iccius, 133.
  nanodes, 132.
  sebetus, 133.
ignicincta, Saliunca, 325.
ignobilis, Mycalesis, 134.
Ilema albicostata, 297.
ilithya, Byblia, 158.
illyris, Papilio, 249.
Imbrasia, 317.
  epimethea, 317.
  obscura, 317, 318.
imitans, Euphædra, 169. Pl. VII, Fig. 2.
immaculata, Leptosia medusa, 235.
  Nychitona medusa, 235.
imperialis, Charaxes, 207.
inanoides, Euphædra, 116, **175.** Pl. XI, Figs. 2 and 3.
inanum, Euphædra, 175, 176.
inaria, Hypolimnas, 154.
incerta, Pamphila, 259.
  Pardaleodes, 259.
indicata, Nacoleia, 328.
  Noctua, 328.
  Phalæna, 328.
infida, Pieris, 239.
infirma, Aburina, 286.
  Naxia, 286.
infracta, Anaphe, 307.
infusca, Diestogyna doriclea, 190.
  Euriphene, 190.
infuscata, Acræa, 126.
  Acræa encedon, 126.
innotata, Euphædra medon, 116, **179.** Pl. IX, Fig. 6.
inornata, Mocis, 284.
  Trigonodes, 284.
inornatus, Leptalina, 256, 257.
insignis, Acræa, 131.
insignis siginna, Acræa, 131.
inspersa, Chrysopoloma, 322.
intermedia, Abisara, 213.
invaria, Anace, 264.
  Metarctia, 264.
iole, Lachnoptera, 142.
  Papilio, 142.
Iolus antifaunus, 223.
isis, Castalius, 231.
  Cupido, 231.
  Papilio, 231.
Ismene bixæ, 262.
  florestan, 262.
  unicolor, 262.
itonia, Ypthima, 142.
ituria, Lycænesthes, 227.
iturina, Euryphene, 185.

ja, Abantis, 254.
jalema, Acræa, 130.
Jana, 303.
  camerunica, **303,** 304.
  eurymas, 303.
  gabunica, 304.
  marmorata, 304.
  nobilis, 304.
  strigina, 304.
jobates, Cupidopsis, 233.
jodutta, Acræa, 123.

  Cymothoë, 198.
  Harma, 198.
  Papilio, 123.
jodutta dorotheæ, Acræa, 123.
johnstoni, Cymothoë, 197.
Junonia, **144**, 145, 146, 149.
  cebrene, 145.
  ceryne, 149.
  clelia, 144, 146.
  lavinia, 146.
  œnone, 145, 146.
  orithya, 144, 146.
  orithya madagascariensis, 144.
  sophia, 145.
  westermanni, **145**, 146.

kahldeni, Charaxes, 209.
kahli, Diestogyna, 116, **191.** Pl. XII, Fig. 13.
  Leucoperina, 117, **296.**
Kallima, 146, 150, **154.**
  ansorgei, 154.
  cymodoce, 154.
  rattrayi, 154.
  rumia, 154.
Kallimula, 116, 146, 147, **149,** 150.
  actia, 150.
  antilope, 150.
  antilope cuama, 150.
  cœlestina, 150.
  eurodoce, 150.
  harpyia, 149, 152.
  leodice, 152.
  milonia, 150, **151.**
  osborni, 116, 149, **150.** Pl. VII, Figs. 7 and 8.
  pelarga, 150, **152.**
  pelarga harpyia, 150.
  pelarga leodice, 150.
  sinuata, 150, **151.**
karschi, Euphædra, 179.
kersteni, Lycænesthes larydas, 228.
Kharsanda æthiops, 232.
kowara, Precis, 151.

labdaca, Dichora, 212.
  Libythea, **212,** 213.
lachares, Lycænesthes, 228.
Lachnocnema, 220.
  luna, 221.
  magna, 221.
  reutlingeri, 221.
Lachnoptera, 142.
  iole, 142.
  hecatæa, 142.
lacista, Deinypena, 291.
Lælia, **298,** 299.
  hildoides, 117, **298** (Fig. 5).
  lignicolor, 298.
  soloides, 117, **299.** Pl. XIV, Fig. 7.
lætitia, Euryphene, 186.
Lampides, 222.
langaria, Gonanticlea, 117, **311.** Pl. XIV, Fig. 9.
langi, Callocossus, 117, **318.** Pl. XIV, Fig. 8.
  Cymothoë, 116, **197.** Pl. VIII, Figs. 7 and 8.
  Epitola, 116, **217.** Pl. XII, Fig. 10.
  Mycalesis, 116, **139,** 140. Pl. X, Fig. 10.
  Myopsyche, 116, **262,** 263 (Fig. 2).
laodice, Charaxes, 210.
  Papilio, 210.
laronia, Hesperia, 256.
  Osmodes, 256.
  Plastingia, 256.
Larentiinæ, 311.
larydas, Lycænesthes, 228.
  Papilio, 228.
larydas kersteni, Lycænesthes, 228.
Lasiocampa rudis, 322.
Lasiocampidæ, 320.
latefasciata, Euphædra preussi, 116, **175.** Pl. XI, Fig. 8.
lathetica, Deinypena, 291.
latifimbriata, Zeritis, 225.
lativittata, Neptis agatha, 160.
latona, Cyligramma, 277.
  Noctua, 277.
latreillei, Ægocera, 271.
latreillii, Ægocera, 271.
lavinia, Junonia, 146.
lebona, Hypolycæna, 223, 224.
leda, Melanitis, 131.
leda africana, Melanitis, 131.

Leipoxais, 320, 321.
    punctulata, 117, **320.** Pl. XIV, Figs. 1 and 2.
Lemoniidæ, 213.
Leocyma, 277.
    congoënsis, 117, **277.** Pl. XIII, Fig. 13.
leodice, Kallimula, 152.
    Kallimula pelarga, 150.
    Papilio, 152.
    Precis, 152.
leonidas, Papilio, 249.
lepeletieri, Leptalina, 256, 257.
Leptalina, **256,** 257.
    inornatus, 256, 257.
    lepeletieri, 256, 257.
    niangarensis, 116, 250, **256,** 257. Pl. XII, Fig. 3.
    tsita, 256, 257.
    unicolor, 256.
leptoglena, Mycalesis, 139.
Leptosia, 235.
    medusa, 235.
    medusa immaculata, 235.
    nupta, 236.
lermanni, Neptis, 164.
lesbonax, Euryphene, 188.
lethe, Euchromia, 265.
    Zygæna, 265.
Leucania apparata, 273.
    prominens, 272.
Leucochitonia lucetia, 252.
leucogaster, Abantis, 254.
leucographa, Acræa, 131.
Leucoma nitida, 295.
leuconoë, Deilemera, 268.
    Nyctemera, 268.
Leucoperina, 296.
    atroguttata, 296.
    kahli, 117, **296.**
leucopygus, Apaustus, 255.
levubu, Abantis, 255.
liara, Hypolycæna, 224.
libentina, Liptena, 217.
    Pseudcresia, 217.
Libyoclanis, 300.
    hollandi, 300.
Libythea, 212.
    labdaca, **212,** 213.
Libytheidæ, 212.
lichas bebra, Charaxes, 212.
    Philognoma, 212.
ligata, Catacroptera cloanthe, 152, 153.
lignicolor, Lælia, 298.
Limacodidæ, 323.
limniace, Danais, 119.
Liparis crocicollis, 296.
Liptena libentina, 217.
    milca, 144.
Lipteninæ, 112, **214.**
Lithosiinæ, 266.
litura, Noctua, 273.
    Prodenia, 273.
lofu, Abantis, 255.
lormieri, Papilio menestheus, 247.
losinga, Euphædra, 180.
    Romalæosoma, 180.
lucasi, Euryphene, 116, **183.** Pl. IX, Figs. 4 and 5.
lucetia, Eagris, 252.
    Leucochitonea, 252.
lucretia, Abantis, 255.
    Papilio, 165.
    Pseudacræa, 165.
lucretius, Charaxes, 207.
    Papilio, 207.
luna, Lachnocnema, 221.
lunata, Lycoselene, 274.
    Risoba, 274.
lunulata, Lycænesthes, 227.
lurida, Cymothoë, 201.
lutea, Metarctia, 264.
luteibarba, Rhodogastria, 267.
luteipes, Stilpnotia, 295.
luteola, Euryphene, 188.
lutescens, Diacrisia, 267.
    Spilosoma, 267.
lutzi, Triclema, 116, **229.** Pl. XII, Fig. 2.
lyæus, Papilio nireus, 246.
Lycæna antanossa, 234.
    asopus, 232.
    carana, 231.
    cyara, 230.
    gaika, 234.
    heritsia, 230.

  mirza, 231.
  ornata, 234.
  osiris, 232.
  patricia, 233.
  togara, 233.
Lycænesthes, 227.
  ituria, 227.
  lachares, 228.
  larydas, 228.
  larydas kersteni, 228.
  lunulata, 227.
  makala, 228.
  musagetes, 227.
  pyroptera, 229.
  rufomarginata, 228.
  scintillula, 229.
  silvanus, 227.
  thyrsis, 227.
Lycænidæ, 112, 113, **213,** 222.
Lycæninæ, 218.
lycia, Acræa encedon, 125.
  Papilio, 125.
lycoa, Acræa, 123.
Lycoselene lunata, 274.
Lymantria, 297.
Lymantriidæ, 295.
lysimon, Cupido, 234.
  Papilio, 234.
  Zizera, 234.

mabillei, Xanthospilopteryx, 270.
macaria, Papilio, 122.
  Planema, 122.
macarina, Acræa, 122.
Macroglossa westermannii, 302.
maculata, Sape, 250.
  Sarangesa, 250.
  Terias brenda, 241.
maculosa, Bombyx, 267.
  Diacrisia, 267.
  Nephele funebris, 301.
madagascariensis, Crenis, 159.
  Junonia orithya, 144.
magna, Lachnocnema, 221.
magus, Erebus, 278.
  Cyligramma, 278.
makala, Lycænesthes, 228.
malathana, Cupido, 232.
mandanes, Mycalesis, 134.
mandinga, Euryphene, 184.
mangoënsis, Epitola, 218.
mania, Achæa, 282.
mardania, Euryphene, 187.
  Papilio, 187.
margaritaceus, Castalius, 231.
marginepunctata, Charaxes protoclea, 116, **206.**
margine-punctata, Deinypena, 291.
marina, Amata, 263.
  Syntomis, 263.
marmorata, Jana, 304.
Marpesiinæ, 159.
marpessa, Neptis, 160.
martius, Mycalesis, 136, 137.
Maruca, 331.
  testulalis, 331.
massagaria, Hypochrosis, 309.
Massagidia, 272.
  hesparia, 272.
materna, Noctua, 285.
  Ophideres, 285.
  Phalæna, 285.
mathias, Chapra, 257.
  Hesperia, 257.
maura, Arcte, 277.
  Cocytodes, 277.
mauritia, Noctua, 268.
mawamba, Diestogyna, **189,** 191.
maxima, Euphædra xypete, 116, **178.**
maximiniana, Euryphene, 187. Pl. VII, Fig. 10.
mechowi, Charaxes, 205.
  Charaxes eudoxus, 205.
  Diadema, 155.
  Hypolimnas, 155.
mechowiana, Papilio cypræafila, 245.
mechowianus, Papilio, 245.
medjaria, Acidalia, 117, **312** (Fig. 6).
medjensis, Ctenogyna, 117, **305.** Pl. XIV, Fig. 10.
  Proterozeuxis, 117, **325.** Pl. XIV, Fig. 12.
  Telipna, 116, **214.** Pl. XII, Fig. 8.
  Xanthospilopteryx, 117, **271.** Pl. XIII, Fig. 1.
medon, Euphædra, 116, 179, 180.

  Papilio, 179.
medon innotata, Euphædra, 116, **179.** Pl. IX, Fig. 6.
medontias, Bicyclus, 116, 132, 133.
medontias obsoletus, Bicyclus, 116, **132.** Pl. VII, Fig. 1.
medusa, Leptosia, 235.
  Papilio, 235.
medusa immaculata, Leptosia, 235.
  Nychitona, 235.
Megadrepana, 320.
  cinerea, 320.
megæra, Euchloron, 302.
  Euchloron megæra, 302.
  Sphinx, 302.
megæra megæra, Euchloron, 302.
Megalopalpus, 218.
  bicoloraria, 218, 220.
  metaleucus, 218, 220.
  similis, 218, 220.
  simplex, 218, 220.
  zymna, 218, 219, **220.**
Meganaclia, 263.
  carnea, 263.
  perpusilla, 263.
Melanitis, 131.
  africana, 131.
  ansorgei, 132.
  bammakoo, 131.
  leda, 131.
  leda africana, 131.
melanomitra, Oxylides, 223.
melanops, Diestogyna, 189.
meleagris, Hamanumida, 167.
  Hamanumida dædalus, 167.
  Papilio, 167.
melicerta, Neptis, 164.
  Papilio, 164.
Melinoessa, 308.
  crœsaria, 308.
  stellata, 308.
Melittia auristrigata, 331.
melusina, Mycalesis, 135.
  Papilio, 135.
menestheus, Papilio, 247.
menestheus lormieri, Papilio, 247.
menippe, Acræa, 130.
mesochloris, Parasa, 323.
Mesoxantha, 158.
  ethosea, 158.
Metagarista, 271.
  triphænoides, 271.
Metaleptina, 276.
  digramma, 276.
metaleucus, Megalopalpus, 218, 220.
metanira, Neptis, 161.
metaprotea, Acræa, 123.
Metarctia, **264,** 265.
  chapini, 116, **264.** Pl. XIII, Fig. 4.
  erubescens, 264.
  hæmatica, 264.
  invaria, 264.
  lutea, 264.
  perpusilla, 263.
  rubripuncta, 265.
metella, Neptis, 160.
Methorasa, 280.
  eximia, 280.
micacea, Hyda, 250.
micans, Euryphene absolon, 182.
Micronia erycinaria, 318.
micylus, Everes, 233.
micylus togara, Cupido, 233.
milca, Liptena, 144.
  Vanessula, 144.
Miletus zymna, 220.
milonia, Kallimula, 150, 151.
  Precis, 151.
milyas, Mycalesis, 138.
minor, Eudæmonia brachyura, 117, **316.**
Minucia david, 280.
  producta, 279.
miriam, Mycalesis, 135.
  Papilio, 135.
mirza, Azanus, 231.
  Cupido, 231.
  Lycæna, 231.
misippus, Hypolimnas, 154.
  Papilio, 154.
Mocis, **283,** 284.
  frugalis, 283.
  inornata, 284.
  repanda, 283.
  undata, 284.
mollitia, Mycalesis, 136.

Mominæ, 284.
monteironis, Diadema, 155.
  Hypolimnas, 155.
Monura, 212.
  zingha, 212.
mormoides, Achæa, 282.
morosa, Deinypena, 117, **291.** Pl. XIII, Fig. 18.
morosa pallidior, Deinypena, 117, **292.**
mozambica, Spindasis, 224.
multilinea, Ercheia, 282.
multilineata, Deinypena, 117, **292.** Pl. XIV, Fig. 5.
murina, Ergolis, 158.
musagetes, Lycænesthes, 227.
muscosa, Dasychira, 297.
  Notohyba, 297.
musivalis, Agathodes, 329.
Mycalesis, 133.
  agraphis, 141.
  analis, 133.
  asochis, 134.
  auricruda, 134, **135.**
  baumanni, **137,** 138, 140.
  chapini, 116, **140.** Pl. VII, Fig. 9.
  desolata, 139.
  dubia, 137.
  eliasis, 142.
  evenus, 139.
  golo, 136, **137.**
  golo violascens, 137.
  iccius, 133.
  ignobilis, 134.
  langi, 116, **139,** 140. Pl. X, Fig. 10.
  leptoglena, 139.
  mandanes, 134.
  martius, 136, 137.
  melusina, 135.
  milyas, 138.
  miriam, 135.
  mollitia, 136.
  nebulosa, 141.
  obscura, 136.
  pavonis, 138.
  peitho, 142.
  perspicua, 141.
  phæa, 141.
  safitza, 139, 140.
  safitza æthiops, 139.
  safitza evenus, 139.
  sambulos, 134.
  sandace, **135,** 138.
  sebetus, 133.
  sophrosyne, 136.
  tænias, 134.
  tolosa, 141.
  uniformis, 135.
  vulgaris, 141.
  vulgaris tolosa, 141.
  xeneas, 133.
mycerina, Charaxes, **210,** 211.
  Nymphalis, 210.
Mylantria, 297.
  xanthospila, 297.
Mylothris, 236.
  bernice, 237.
  chloris, 236.
  poppea, 237.
  rubricosta, 237.
  sjöstedti, 236.
  spica, 116, 117, **236,** 237.
  spica donovani, 116, 117, **236,** 237.
  sulphurea, 237.
Myopsyche, 262.
  langi, 116, **262,** 263 (Fig. 2).
  ochsenheimeri, 263.

Nacaduba, 232.
  æthiops, 232.
  stratola, 232.
Nacoleia, 328.
  indicata, 328.
  pœonalis, 328.
namaquaana, Abantis, 254.
nanodes, Bicyclus hewitsoni, 132.
  Idiomorphus, 132.
Naroma, 295.
  signifera, 295.
Narthecusa tenuiorata, 310.
natalensis, Aphnæus, 224.
  Asterope, 159.
  Crenis, 159.
  Ctenogyna, 306.
  Spindasis, 224.
Naxia, 286.

  apiciplaga, 282.
  infirma, 286.
neander, Acromecis, 260.
  Andronymus, 260.
  Apaustus, 260.
nebulosa, Mycalesis, 141.
Negla, 310.
  tenuiorata, 310.
nelsoni, Acræa, 121.
  Planema, 121. Pl. VI, Figs. 1 and 2.
nemetes, Neptis, 160.
neobule, Acræa, 131.
Nephele, 300.
  accentifera, 301.
  bipartita, 301.
  comma, 300.
  funebris, 301.
  funebris funebris, 301.
  funebris maculosa, 301.
  peneus, 301.
  peneus peneus, 301.
neptidina, Pseudathyma, 203.
Neptidinæ, 159.
Neptidomima, 116, **164.**
  exaleuca, 116, **164.**
Neptidopsis, 157.
  ophione, 157.
Neptis, **159,** 164.
  agatha, 160. Pl. VI, Figs. 7 and 8.
  agatha lativittata, 160.
  biafra, 162, **163.** Pl. VIII, Fig. 3.
  biafra continuata, 162.
  continuata, 162.
  exaleuca, 116, 164.
  lermanni, 164.
  marpessa, 160.
  melicerta, 164.
  metanira, 161.
  metella, 160.
  nemetes, 160.
  nicobule, 164.
  nicomedes, 162.
  nicomedes quintilla, 162.
  nicoteles, 163.
  nysiades, **161,** 162.
  pasteuri, 160.
  saclava, 160.
  seeldrayersi, 161.
  strigata, 163.
niangarensis, Leptalina, 116, 250, **256,** 257. Pl. XII, Fig. 3.
niavius, Amauris, 119.
  Papilio, 119.
nichetes, Charaxes, 210.
nicobule, Neptis, 164.
nicomedes, Neptis, 162.
nicomedes quintilla, Neptis, 162.
nicoteles, Neptis, 163.
nigeriana, Abantis, 254.
nigricans, Eutelia, 117, **274.** Pl. XIII, Fig. 8.
nigriplaga, Polyptychus, 300.
nireus, Papilio, 245.
nireus lyæus, Papilio, 246.
Nisoniades flesus, 251.
  ophion, 251.
nitida, Leucoma, 295.
njami, Euphædra preussi, **172,** 173.
njamnjami, Euphædra preussi, **173,** 174, 175.
nobicea, Papilio, 245.
nobilis, Charaxes, 208.
  Jana, 304.
Noctua algira, 283.
  chlorea, 285.
  frugalis, 283.
  indicata, 328.
  latona, 277.
  litura, 273.
  materna, 285.
  mauritia, 268.
  orichalcea, 284.
  pancratii, 273.
  punctum, 289.
  recurvalis, 327.
  repanda, 283.
  stolida, 283.
  undata, 284.
  vidua, 268.
Noctuidæ, **272,** 294.
Noctuinæ, 284.
Nola, 266.
  bananæ, 116, **266** (Fig. 3).
Nolinæ, 266.
notata, Euphædra preussi, 116, **173.** Pl. XI, Fig. 1.

nothus, Ceratrichia, 259.
Notodontidæ, 305.
Notohyba muscosa, 297.
nuba, Ægeria, 331.
  Sesia, 331.
nubila, Chrysopoloma, 117, **322** (Fig. 7).
  Papilio demodocus, 246.
nubilata, Dermaleipa, 117, **278.** Pl. XIII, Fig. 15.
Nudaurelia, 318.
  emini, 318.
numenes, Charaxes, 207.
  Nymphalis, 207.
nupta, Leptosia, 236.
  Nychitona, 236.
nyanza, Telipna, 214, 215.
Nychitona medusa immaculata, 235.
  nupta, 235.
Nyctemera fallax, 268.
  leuconoë, 268.
Nyctipao, 277.
  valceri, 277.
  walkeri, 277.
Nygmia orestes, 297.
Nymphalidæ, 112, 113, **142.**
Nymphalinæ, 164.
Nymphalis candiope, 209.
  etesipe, 206.
  hildebrandti, 208.
  mycerina, 210.
  numenes, 207.
  sangaris, 200.
nysiades, Neptis, **161,** 162.
Nyssia vivida, 323.

oberthüri, Acræa, 127.
  Catuna, 166.
oberthüri confluens, Acræa, 127.
obliqua, Ægocera, 272.
obliterata, Hypolimna bartteloti, 116, **156.** Pl. VI, Fig. 5.
Oboronia, 234.
  elorea, 235.
  ornata, 116, 234.
  ornata flava, 116, **235.**
  ornata vestalis, 235.
  plurilimbata, 234.
  punctata, 234.
Obrussa catenata, 308.
obscura, Deinypena, 117, **294.** Pl. XIV, Fig. 11.
  Gonimbrasia, 317.
  Imbrasia, 317, 318.
  Mycalesis, 136.
obscurior, Catacroptera, 153.
obsoletus, Bicyclus medontias, 116, **132.** Pl. VII, Fig. 1.
occidentalis, Enmonodia, 278.
occidentalium, Asterope, 159.
  Crenis, 159.
ocellata, Glyphodes, 330.
ochrata, Acidalia, 312.
ochsenheimeri, Myopsyche, 263.
octavia, Precis, 145, **146,** 147, 150.
  Papilio, 146.
octavia amestris, Precis, 147.
octavia sesamus, Precis, 147.
octo, Amyna, 289.
Œcophoridæ, 331.
Œcura crucifera, 297.
œnone ,Junonia, 145, 146.
ogova, Cymothoë, 116, 201, **202.** Pl. X, Figs. 3 and 4.
  Harma, 202.
ogova rubescens, Cymothoë, 116, **203.**
ogovensis, Charaxes, 210.
  Ctenogyna, 306.
  Redoa, 295.
  Stilpnotia, 295.
  Syntomis, 263.
Olapa, 296.
  flabellaria, 296.
Ophideres, 284.
  divitiosa, 285.
  fullonica, 284.
  materna, 285.
  princeps, 285.
Ophiodes catocalina, 280.
  parallelipipeda, 279.
ophion, Nysionades, 251.
  Papilio, 251.
ophione, Neptidopsis, 157.
  Papilio, 157.
Ophiusa albifimbria, 282.
opis, Cynandra, 166.

Papilio, 166.
orcas, Aphnæus, 224.
Thecla, 224.
orestes, Chærotriche, 297.
Nygmia, 297.
orestia, Acræa, 124.
orichalcea, Noctua, 284.
Phytometra, 284.
orina, Acræa, 124.
orithya, Junonia, 144, 146.
Precis, 144, 146.
orithya madagascariensis, Junonia, 144.
ornata, Oboronia, 116, 234.
Lycæna, 234.
ornata flava, Oboronia, 116, **235.**
ornata vestalis, Oboronia, 235.
ornatus, Cupido, 234.
orthographus, Polyptychus, 300.
Orthostixinæ, 311.
osborni, Kallimula, 116, 149, **150.** Pl. VII, Figs. 7 and 8.
osiris, Cupido, 232.
Deilephila, 302.
Hippotion, 302.
Lycæna, 232.
Osmodes, 256.
fan, 259.
laronia, 256.
Osteosema, **313,** 314.
phyllobrota, 117, **313.** Pl. XIV, Fig. 6.
oxione, Euryphene, 184.
Oxylides, 222.
homeyeri, 222. Pl. XII, Fig. 5.
melanomitra, 223.
Ozarba, 289.

Pachyzancla, 331.
bipunctalis, 331.
Pacidara venustissima, 274.
pactolica, Amphicallia, 268. Pl. XIII, Fig. 2.
pactolicus, Amphicallia, 268.
Pleretes, 268.
pagenstecheri, Ergolis, 158.
Pagyda, 327.
caritalis, 327.
traducalis, 327.
Palla, 211.
decius, 211.
fulvescens, 211.
ussheri, 211.
vologeses, 211.
pallidior, Deinypena morosa, 117, **292.**
palumbata, Hyphenophora, 307.
Palyas perlimbata, 307.
Pamphila cænira, 261.
calpis, 261.
incerta, 259.
sator, 259.
Pamphilinæ, 255.
Panacra rutherfordi, 303.
pancratii, Brithys, 273.
Noctua, 273.
paphianus, Philognoma, 212.
Charaxes, 212.
Papilio, 114, **244.**
absolon, 182.
æthiops, 153.
agatha, 160.
alcippus, 118.
amestris, 147.
angolanus, 248.
antheus, 249.
anticlea, 208.
antimachus, 244.
argia, 243.
bæticus, 232.
bixæ, 262.
boisduvalianus, 244.
bonasia, 127.
brigitta, 242.
bromius, 246.
brutus, 204.
cacta, 153.
cæcilia, 129.
cænis, 198.
camillus, 159.
calypso, 239.
cardui, 143.
castor, 205.
cepheus, 129.
charcedonius, 249.
chelys, 132.
chloris, 236.

chrysippus, 118.
clelia, 144.
cloanthe, 152.
cœnobita, 166.
columbina, 143.
creona, 238.
crithea, 166.
cynorta, 244.
cypræafila mechowiana, 245.
dædalus, 167.
damocles, 119.
dardanus, 244.
decius, 211.
delius, 143.
demodocus, 246.
demodocus nubila, 246.
demoleus, 246.
dryope, 157.
dubius, 156.
edipus, 259.
egina, 130.
eleus, 169.
encedon, 125.
enotrea, 158.
epæa, 120.
epaphia, 238.
etheocles, 208.
ethosea, 158.
eudoxus, 205.
eupale, 209.
evippe, 240.
flesus, 251.
florella, 243.
forestan, 262.
galene, 167.
gallienus, 245.
harpax, 226.
harpyia, 152.
helcita, 311.
hesperus, 245.
hiarbas, 157.
hippocoön, 244.
illyris, 249.
iole, 142.
isis, 231.
jodutta, 123.
laodice, 210.
larydas, 228.
leodice, 152.
leonidas, 249.
lucretia, 165.
lucretius, 207.
lycia, 125.
lysimon, 234.
macaria, 122.
mardania, 187.
mechowianus, 245.
medon, 179.
medusa, 235.
meleagris, 167.
melicerta, 164.
melusina, 135.
menestheus, 247.
menestheus lormieri, 247.
miriam, 135.
misippus, 154.
niavius, 119.
nireus, 245.
nireus lyæus, 246.
nobicea, 245.
octavia, 146.
ophion, 251.
ophione, 157.
opis, 166.
parrhasia, 124.
pelarga, 152.
phegea, 131.
phocion, 259.
policenes, 249.
pollux, 205.
pylades, 248.
rhodope, 117, 236, 237.
ridleyanus, 116, **247.** Pl. VI, Fig. 3.
ridleyanus fumosus, 116, **247.** Pl. VI, Fig. 4.
salmacis, 154.
semire, 165.
silvanus, 227.
sophia, 145.
sophus, 186.
telicanus, 231.
terea, 149.
terpsichore, 128.
theorini, 248.
tiridates, 207.
tyndaræus, 248.

  ucalegon, 248.
  ucalegonides, 248.
  zalmoxis, 244.
  zenobia, 245.
  zetes, 130.
  zingha, 212.
Papilionidæ, 235.
Papilioninæ, 244.
Parachalciope, 283.
  benitensis, 283.
paradisea, Abantis, 254.
Paragerydus, 218.
Parallelia, **283**, 286.
  algira, 283.
parallelipipeda, Dermaleipa, 279.
  Ophiodes, 279.
Parasa, 323.
  mesochloris, 323.
  trapezoides, 323.
  vivida, 323.
Pardaleodes, 259.
  bule, 259.
  edipus, 259.
  fan, 259.
  incerta, 259.
  rutilans, 251.
Pardopsis punctatissima, 216.
pardus, Entomogramma, 278.
parhassus, Salamis, 153.
parhassus æthiops, Salamis, 153.
parmeno, Gnophodes, 132.
Parnara, **257**, 258.
  alberti, 258.
  batangæ, 258.
  borbonica, 257.
parrhasia, Acræa, 124.
  Papilio, 124.
parsimon, Cupido, 233.
partita, Euryphene, 185.
pasteuri, Neptis, 160.
patricia, Cupido, 233.
  Lycæna, 233.
Patula walkeri, 277.
paucicolor, Xanthospilopteryx, 271.
pauli, Pentila, 216.
pavonis, Mycalesis, 138.
peitho, Henotesia, 142.
  Mycalesis, 142.
pelarga, Kallimula, 150, **152**.
  Papilio, 152.
  Precis, 152.
pelarga leodice, Kallimula, 150.
pelarga harpyia, Kallimula, 150.
pelasgius, Acræa, 124.
  Acræa peneleos, 124.
peneleos, Acræa, 124.
peneleos pelasgius, Acræa, 124.
penelope, Acræa, 124.
peneus, Nephele, 301.
  Nephele peneus, 301.
  Sphinx, 301.
peneus peneus, Nephele, 301.
Penicillaria subrubens, 274.
pentapolis, Acræa, 125.
pentapolis thelestis, Acræa, 125.
Pentila, **215**, 216.
  abraxas, 216.
  auga, 216.
  bimacula, 215.
  clarensis, 215. Pl. XII, Figs. 11 and 12.
  clœtensi, 216. Pl. XII, Fig. 9.
  pauli, 216.
perenna, Acræa, 129.
perion, Arxiocerses, 225, 226.
  Chrysophanus, 226.
periploca, Ercheia, 281.
perlimbata, Hyphenophora, 307.
  Palyas, 307.
permutans, Acidalia, 312.
  Pseudasthena, 312.
perpusilla, Anace, 263.
  Meganaclia, 263.
  Metarctia, 263.
perseis, Euphædra, 169.
perspicua, Henotesia, 141.
  Mycalesis, 141.
petiverana, Danaida, 119.
  Danais, 119.
phæa, Henotesia, 141.
  Mycalesis, 141.
Phægorista, 270.
  helcitoides, 270.
  similis, 270.
phaëthusa, Euphædra, 176.
  Romalæosoma, 176.

Phalæna bipunctalis, 331.
  chlorea, 285.
  ezea, 282.
  flabellaria, 296.
  fullonica, 284.
  indicata, 328.
  materna, 285.
  phenice, 327.
  sinuata, 330.
phalantha, Atella, 143.
phalantha æthiopica, Atella, 143.
Phalera wærdeni, 305.
phantasia, Euryphene, 187.
phaola, Appias, 237.
  Pieris, 237.
pharis, Eronia, 243.
  Pieris, 243.
pharsalus, Acræa, 126.
Phasicnecus, 304.
  grandiplaga, 117, **304.** Pl. XIV, Fig. 14.
  preussi, 305.
phegea, Elymniopsis, 131.
  Papilio, 131.
phenice, Phalæna, 327.
  Zebronia, 327.
Philognoma, 212.
  falcata, 212.
  lichas bebra, 212.
  paphianus, 212.
Philosamia, 315.
  albida, 315.
  getula, 316.
  plœtzi, 316.
phlegeusalis, Elyra, 290.
Phlyaria, 230.
  cyara, 230.
  heritsia, 230.
phlyaria, Cupido, 230.
phocion, Ceratrichia, 259.
  Papilio, 259.
phranza, Euryphene, 185.
phreone, Euryphene sophus, 187.
Phryganodes, 328.
  biguttata, 328.
  erebusalis, 328.
  sex-guttata, 117, **328** (Fig. 9).
phyllobrota, Osteosema, 117, **313.** Pl. XIV, Fig. 6.
Phytometra, 284.
  acuta, 284.
  orichalcea, 284.
picta, Charaxes etheocles, 209.
Pielus, 253.
pieridaria, Rhamidava, 117, **307.** Pl. XIV, Fig. 13.
Pierinæ, 235.
Pieris, **238,** 308.
  calypso, 239.
  creona, 238.
  infida, 239.
  phaola, 237.
  pharis, 243.
  rubricosta, 237.
  sabina, 238.
  solilucis, 239.
  thalassina, 243.
  theora, 239.
  theuszi, 239.
pillaana, Caprona, 252.
Pitthea, 310.
  continua, 310.
  famula, 310.
  famulita, 117, **310.** Pl. XIII, Fig. 3.
Planema, 120.
  alcinoë, 121.
  consanguinea, 121.
  dewitzi, 121.
  elongata, 121.
  epæa, 120.
  epiprotea, 121.
  macaria, 122.
  nelsoni, 121. Pl. VI, Figs. 1 and 2.
  poggei, 121.
  pseudeuryta, 121.
  tellus, 120.
Plastingia charita, 260.
  laronia, 256.
Platylesches, 258.
  batangæ, 258.
plautilla albofasciata, Euryphura, 193.
Plebeius falkensteini, 230.
  punctatus, 234.
Pleretes pactolicus, 268.
plerotica, Abantis, 254.

Plesioneura galenus, 250.
plicata, Speiridonia, 278.
plinius, *Cupido telicanus*, 231.
Hesperia, 231.
plistonax, Euryphene, 187.
plœtzi, Acleros, 255.
Hesperia, 255.
Philosamia, 316.
plurilimbata, *Cupido*, 234.
Oboronia, 234.
Thermoniphas, 234.
Plusia, 284.
acuta, 284.
Plusiinæ, 284.
pluto, Euptera, 203.
Euryphene, 203.
poënsis, Cymothoë herminia, 116, **196.** Pl. VIII, Fig. 2.
pœonalis, *Botys*, 328.
Nacoleia, 328.
poggei, *Eusemia*, 270.
Planema, 121.
Xanthospilopteryx, 270.
Polacanthopoda, 271.
tigrina, 271.
policenes, Papilio, 249.
pollux, Charaxes, 205.
Papilio, 205.
Polydesma, 287.
umbricola, 287.
Polyommatus, 232.
bæticus, 232.
Polyptychus, 300.
nigriplaga, 300.
orthographus, 300.
polyrabda, Cirphis, 273.
Pompostolinæ, 324.
poppea, Mylothris, 237.
porthos, Charaxes, 210.
Prasinocyma, 312.
unipuncta, 312.
pratinas, *Romalæosoma*, 171.
Precis, 144, **145,** 149, 150, 152.
amestris, 147.
andremiaja, 146.
antilope, 147.
archesia, 146.
artaxia, 146.
cebrene, 145.
ceryne, 146, 149.
chorimene, 146, 147.
clelia, 144, 146.
ethyra, 147.
gregorii, 148.
harpyia, 152.
kowara, 151.
leodice, 152.
milonia, 151.
octavia, 145, **146,** 147, 150.
octavia amestris, 147.
octavia sesamus, 147.
orithya, 144, 146.
pelarga, 152.
rhadama, 146.
simia, 147.
sinuata, 151.
sophia, 145.
stygia, 116, **147.**
stygia fuscata, 116, 147, **148,** 149. Pl. VII, Fig. 5.
stygia gregorii, 147, **148,** 149. Pl. VII, Fig. 4.
stygia stygia, 147, **148,** 149. Pl. VII, Fig. 3.
terea, 146, **149.**
trimeni, 147.
westermanni, 145, 146.
preussi, Euphædra, 116, 168, **171,** 172, 173, 174, 175.
Phasicnecus, 305.
preussi angustior, Euphædra, 116, **175.** Pl. XI, Fig. 7.
preussi fulvofasciata, Euphædra, 116, **174.** Pl. XI, Fig. 6.
preussi latefasciata, Euphædra, 116, **175.** Pl. XI, Fig. 8.
preussi njami, Euphædra, **172,** 173.
preussi njamnjami, Euphædra, 171, **173,** 174, 175.
preussi notata, Euphædra, 116, **173.** Pl. XI, Fig. 1.
preussi subviridis, Euphædra, 116, **174.** Pl. XI, Fig. 4.
princeps, Ophideres, 285.
Problepsis, 313.
ægretta, 313.

Procampta, 252.
  rara, 250, **252.**
Prodenia, 273.
  litura, 273.
producta, Ancyloxypha, 260.
  Anua, 117, **279.**
  Anua, 117, 280.
  Minucia, 279.
promelæna, Stracena, 295.
prominens, Cirphis, 272.
  Leucania, 272.
Proterozeuxis, 325.
  medjensis, 117, **325.** Pl. XIV, Fig. 12.
protoclea, Charaxes, 116, **206.**
protoclea marginepunctata, Charaxes, 116, **206.**
Protoparce convolvuli, 299.
  fulvinotata, 300.
protracta, Pseudacræa, 165.
protrusa, Zamarada, 309.
Pseudacræa, 164.
  clarki, 165.
  clarki egina, 165.
  gottbergi, 165.
  hobleyi, 165.
  hostilia warburgi, 164.
  lucretia, 165.
  protracta, 165.
  semire, 165.
  sibyllina, 203.
Pseudapiconoma glagoessa, 265.
Pseudasthena, 312.
  permutans, 312.
Pseudathyma, 203.
  neptidina, 203.
  sibyllina, 203.
pseudegina, Acræa, 128, 129.
pseudegina abadima, Acræa, 128.
Pseuderesia, 217.
  libentina, 217.
pseudeuryta, Planema, 121.
Pseudogonitis, **275,** 276.
  variabilis, 117, **275.** Pl. XIII, Figs. 5, 6, and 7.
Pseudoneptis, 166.
  cœnobita, 166.
Pseudonotodonta virescens, 297.
Pseudoterpna, **314,** 315.
  chapinaria, 117, **314.** Pl. XIII, Fig. 19.
  ruginaria, 314.
Psychidæ, 331.
psyttalea, Amauris, 119.
Pterygospidea boadicea, 251.
  grisea, 250.
  tergemira, 251.
pudens, Sphingomorpha, 285.
pulchra, Balacra, 265.
pulvina, Hesperia, 258.
  Semalea, 258.
  Trichosemeia, 258.
punctata, Oboronia, 234.
punctatissima, Pardopsis, 216.
punctatus, Cupido, 234.
  Plebeius, 234.
punctulata, Leipoxais, 117, **320.** Pl. XIV, Figs. 1 and 2.
punctum, Amyna, 289.
  Noctua, 289.
pura, Estigmene, 267.
purus, Alpenus, 267.
pylades, Papilio, 248.
Pyralidæ, **326,** 331.
Pyralinæ, 326.
Pyrameis, 143.
  cardui, 143.
Pyraustinæ, 327.
Pyrgus dromus, 255.
  spio, 255.
pyroptera, Lycænesthes, 229.

quintilla, Neptis nicomedes, 162.
quirinalis, Acræa, 125.

rara, Procampta, 250, **252.**
rattrayi, Kallima, 154.
ravola, Euphædra, 176.
  Romalæosoma, 176.
rectilinea, Ægocera, 271.
recurvalis, Hymenia, 327.
  Noctua, 327.
  Zinckenia, 327.
Redoa ogovensis, 295.
Reginæ-Elizabethæ, Cymothoë, 116, **201.** Pl. X, Figs. 5 and 6.

regularis, Terias, 242.
reinholdi, Cymothoë, 194.
Harma, 194.
reinholdii, Cymothoë, 194.
repanda, Mocis, 283.
Noctua, 283.
reutlingeri, Lachnocnema, 221.
rezia, Euphædra, 177.
rezioides, Euphædra, 116, **177.** Pl. XI, Fig. 5.
rhadama, Precis, 146.
Rhamidava, 307, 308.
amplissimata, 307.
pieridaria, 117, **307.** Pl. XIV, Fig. 13.
Rhodogastria, 267.
luteibarba, 267.
vidua, 268.
rhodope, Appias, 237.
Papilio, 117, 236, 237.
Rhopalocampta, 262.
bixæ, 262.
forestan, 262.
unicolor, 262.
Rhopalocera, 114, **118.**
Rhynchodes, 287.
avakubi, 117, **287.** Pl. XIII, Fig. 10.
efulensis, 117, **287.**
ridleyanus, Papilio, 116, **247.** Pl. VI, Fig. 3.
ridleyanus fumosus, Papilio, 116, **247.** Pl. VI, Fig. 4.
Rigema, 305.
wœrdeni, 305.
Risoba, 274.
lunata, 274.
rogersi, Abisara, 213.
Acræa, 126.
Romalæosoma adonina, 177.
afzelii, 176.
coprates, 171.
gausape, 177, 178.
losinga, 180.
phaëthusa, 176.
pratinas, 171.
ravola, 176.
ruspina, 169.
spatiosa, 180.
vetusta, 177.
xypete, 178.
rothi, Telipna, 214.
rothioides, Telipna, 116, **214.** Pl. XII, Fig. 7.
rotundata, Diestogyna, 116, **191.** Pl. XII, Fig. 14.
rubescens, Cymothoë ogova, 116, **203.**
rubida, Cymothoë cænis, 116, 198, **199.** Pl. IX, Fig. 7.
Heterospila, 117, **289.** Pl. XIII, Fig. 12.
rubra, Abantis, 116, 250, **253,** 255. Pl. XII, Fig. 1.
rubricosta, Mylothris, 237.
Pieris, 237.
rubripuncta, Metarctia, 265.
rubriventris, Saliunca, 117, **324** (Fig. 8).
rubrocostata, Euryphene, 188.
rubrofasciata, Acræa althoffi, 127.
rudis, Chrysopoloma, 322.
Lasiocampa, 322.
rufomarginata, Lycænesthes, 228.
rufoplagata, Triclema, 229.
ruginaria, Hypochroma, 314.
Pseudoterpna, 314.
rumia, Kallima, 154.
ruspina, Euphædra, 169.
Romalæosoma, 169.
rutherfordi, Abisara, 213.
Centroctena, 303.
Panacra, 303.
rutherfordii, Abisara, 213.
rutilans, Celænorrhinus, 251.
Pardaleodes, 251.

sabina, Appias, 238.
Pieris, 238.
saclava, Neptis, 160.
safitza, Mycalesis, 139, 140.
safitza æthiops, Mycalesis, 139.
safitza evenus, Mycalesis, 139.
salambo, Acræa, 126.
Salamis, 153.
cacta, 153.
ceryne, 149.

  ethyra, 147.
  parhassus, 153.
  parhassus æthiops, 153.
Saliunca, 324.
  ignicincta, 325.
  rubriventris, 117, **324** (Fig. 8).
  thoracica, 324.
salmacis, Hypolimnas, 154.
  Papilio, 154.
saltusalis, Cirrhochrista, 326.
sambulos, Mycalesis, 134.
Sameodes, 330.
  cancellalis, 330.
  trithyralis, 330.
sandace, Mycalesis, **135,** 138.
sangaris, Cymothoë, **200,** 201, 202, 203.
  Nymphalis, 200.
Sapæa elegantula, 253.
Sape, 250.
  maculata, 250.
Sapelia, **295,** 296.
  bipunctata, 117, **295.** Pl. XIV, Figs. 3 and 4.
saphirina, Diestogyna, 189.
Sarangesa, 250.
  grisea, 250.
  maculata, 250.
Sarrothripinæ, 274.
sator, Pamphila, 259.
Saturniidæ, 315.
Satyridæ, 131.
Satyrinæ, 131.
Schausia, 272.
  gladiatoria, 272.
  transiens, 272.
Schœnobiinæ, 326.
scintullula, Lycænesthes, 229.
sebetus, Bicyclus, 133.
  Idiomorphus, 133.
  Mycalesis, 133.
seeldrayersi, Neptis, 161.
Semalea, 258.
  pulvina, 258.
semiaurata, Charidea, 324.
  Euchromia, 324.
Semiothisa, 308.
semire, Papilio, 165.
  Pseudacræa, 165.
semivitrea, Acræa, 123.
senegalensis, Terias, 240, **241.**
senegalensis bisinuata, Terias, 241.
sericea, Botys, 329.
  Desmia, 329.
  Glyphodes, 329.
  Stemorrhages, 329.
servona, Acræa, 123.
sesamus, Precis octavia, 147.
Sesia nuba, 331.
severini, Euryphene, 186.
sex-guttata, Phryganodes, 117, **328** (Fig. 9).
sexstriata, Trichobaptes, 331.
sibyllina, Pseudacræa, 203.
  Pseudathyma, 203.
siginna, Acræa insignis, 131.
signifera, Naroma, 295.
silvanus, Lycænesthes, 227.
  Papilio, 227.
simia, Precis, 147.
similis, Cirina, 317.
  Megalopalpus, 218, 220.
  Phægorista, 270.
simplex, Amphigonia, 288.
  Episparis, 288.
  Megalopalpus, 218, 220.
Simplicia, 290.
simplicia, Ypthima, 142.
sinuata, Glyphodes, 330.
  Kallimula, 150, 151.
  Phalæna, 330.
  Precis, 151.
Sithon antalus, 222.
sjöstedti, Mylothris, 236.
sjœstedti, Xyleutes, 319.
smaragdalis, Charaxes, 207.
solilucis, Pieris, 239.
Soloë, 299.
soloides, Lælia, 117, **299.** Pl. XIV, Fig. 7.
sophia, Junonia, 145.
  Papilio, 145.
  Precis, 145.
sophrosyne, Mycalesis, 136.
sophus, Euryphene, 186.
  Papilio, 186.
sophus phreone, Euryphene, 187.

spatiosa, Euphædra, 180.
  Romalæosoma, 180.
Speiridonia, 278.
  plicata, 278.
sperchia, Euchromia, 266.
  Sphinx, 266.
Sphingidæ, 114, **299.**
Sphingomorpha, 285.
  aliena, 117, **285.** Pl. XIII, Fig. 14.
  chlorea, 285.
  pudens, 285.
Sphinx accentifera, 301.
  atropos, 300.
  celerio, 302.
  cerbera, 263.
  convolvuli, 299.
  eson, 303.
  funebris, 301.
  hypparchus, 324.
  megæra, 302.
  peneus, 301.
  sperchia, 266.
spica, Mylothris, 116, 117, **236,** 237.
  Tachyris, 236.
spica donovani, Mylothris, 116, 117, **236,** 237.
Spilosoma curvilinea, 267.
  lutescens, 267.
Spindasis, 224.
  aderna, 225. Pl. XII, Fig. 4.
  chapini, 116, **225.** Pl. XII, Fig. 6.
  crustaria, 224.
  fallax, 225.
  mozambica, 224.
  natalensis, 224.
spio, Pyrgus, 255.
  Syrichtus, 255.
staudingeri, Cymothoë, 197.
stellata, Melinoessa, 308.
Stemorrhages sericea, 329.
Stethotrix heterogyna, 252.
Stilpnotia, 295.
  luteipes, 295.
  ogovensis, 295.
stolida, Grammodes, 283.
  Noctua, 283.
Stracena, 295.
  fuscivena, 295.
  promelæna, 295.
stratola, Nacaduba, 232.
strigata, Neptis, 163.
strigina, Jana, 304.
Striphnopterygidæ, 303.
stygia, Precis, 116, **147.**
  Precis stygia, 147, **148,** 149. Pl. VII, Fig. 3.
stygia fuscata, Precis, 116, 147, **148,** 149. Pl. VII, Fig. 5.
stygia gregorii, Precis, 147, **148,** 149. Pl. VII, Fig. 4.
stygia stygia, Precis, 147, **148,** 149. Pl. VII, Fig. 3.
subrubens, Eutelia, 274.
  Penicillaria, 274.
subsignata, Achæa, 281.
  Ercheia, **281,** 282.
subtentyris, Euryphene, 181.
subviridis, Euphædra preussi, 116, **174.** Pl. XI, Fig. 4.
sulphurea, Mylothris, 237.
supponina, Acræa, 127.
  Acræa bonasia, 127.
Syllepta, 329.
Syntomidæ, 262.
Syntomis, 263.
  bivittata, 263.
  cerbera, 263.
  marina, 263.
  ogovensis, 263.
Syrichtus spio, 255.

Tachyris spica, 236.
tadema, Aterica, 189.
  Diestogyna, **189,** 191.
tænias, Mycalesis, 134.
Tagiades, 251.
  flesus, 251.
  wærmanni, 251.
Tagoropsis, 317.
  gemmifera, 317.
Tarucus, 231.
  telicanus, 231.
tartarea, Amauris, 120.
telicanus, Papilio, 231.
  Tarucus, 231.
telicanus plinius, Cupido, 231.

Telipna, 214.
  bimacula, 215.
  medjensis, 116, **214**. Pl. XII, Fig. 8.
  nyanza, 214, 215.
  rothi, 214.
  rothioides, 116, **214**. Pl. XII, Fig. 7.
tellus, Planema, 120.
Temnora, 301.
  eranga, 301.
  fumosa, 301.
tentyris, Euryphene, 181.
tenuiorata, *Narthecusa*, 310.
  Negla, 310.
Teracolus, 112, **240**.
  evippe, 240.
terea, *Papilio*, 149.
  Precis, 146, 149.
tergemira, *Pterygospidea*, 251.
Terias, 240.
  bisinuata, 241.
  brenda, 240.
  brenda maculata, 241.
  brigitta, 242.
  ceres, 242.
  desjardinsi, 242.
  floricola, 242.
  floricola ceres, 242.
  hapale, 242.
  regularis, 242.
  senegalensis, 240, **241**.
  senegalensis bisinuata, 241.
  zoë, 243.
terpsichore, Acræa, 128.
  Papilio, 128.
terpsichore buxtoni, Acræa, 128.
testulalis, Maruca, 331.
  Crocidophora, 331.
tettensis, Abantis, 253, 254.
thalassina, Eronia, 243.
  Pieris, 243.
Thecla orcas, 224.
thelestis, *Acræa*, 125.
  Acræa pentapolis, 125.
themis, Euphædra, 177.
theobene, Cymothoë, 194.
  Harma, 194.
theodosia, Cymothoë, **194**, 196.
theophane, *Aterica*, 167.
theora, Pieris, 239.
theorini, Papilio, 248.
Thermesia, 278.
Thermoniphas plurilimbata, 234.
theuszi, Pieris, 239.
thoracica, Saliunca, 324.
  Tipulodes, 324.
Thyrididæ, 325.
thyrsis, Cupidesthes, 227.
  Lycænesthes, 227.
tigrina, *Hespagarista*, 271.
  Polacanthopoda, 271.
Tineidæ, 331.
Tipulodes thoracica, 324.
tiridates, Charaxes, 207.
  Papilio, 207.
togara, *Cupido micylus*, 233.
  Everes, 233.
  Lycæna, 233.
Tolna, 280.
  bolengensis, 117, **280**. Pl. XIII, Fig. 9.
  eximia, 280.
tolosa, *Mycalesis*, 141.
  Mycalesis vulgaris, 141.
traducalis, *Eudioptis*, 327.
  Pagyda, 327.
trajanus, Euxanthe, 204.
  Godartia, 204.
transiens, Schausia, 272.
transversata, **Deinypena**, 117, **293**. Pl. XIII, Fig. 17.
trapezoides, Parasa, 323.
triangularis, Deinypena, 291.
Trichæta, 263.
  bivittata, 263.
Trichobaptes, 331.
  auristrigata, 331.
  sexstriata, 331.
Trichosemeia pulvina, 258.
Triclema, 229.
  lutzi, 116, **229**. Pl. XII, Fig. 2.
  rufoplagata, 229.
Trigonodes inornata, 284.
trimeni, *Abantis*, 254.
  Precis, 147.

triphænoides, Metagarista, 271.
trithyralis, Sameodes, 330.
tsita, Leptalina, 256, 257.
tyndaræus, Papilio, 248.

ucalegon, Papilio, 248.
ucalegonides, Papilio, 248.
Ulopeza, 327.
umbra, Arrugia, 221.
umbricola, Polydesma, 287.
umbrina, Euryphene, 192.
umvulensis, Abantis, 254.
undata, Mocis, 284.
  Noctua, 284.
unicolor, Cyclopides, 256.
  Hesperia, 262.
  Ismene, 262.
  Leptalina, 256.
  Rhopalocampta, 262.
uniformis, Mycalesis, 135.
unipuncta, Prasinocyma, 312.
Uraniidæ, 318.
Uranothauma, 230.
  falkensteini, 230.
uroarge, Eudæmonia, 316.
uselda, Harma, 200.
ussheri, Palla, 211.

vaillantina, Bombyx, 277.
  Egybolis, 277.
valceri, Nyctipao, 277.
Vanessa chorimene, 147.
Vanessinæ, 143.
Vanessula, 144.
  milca, 144.
variabilis, Pseudogonitis, 117, **275.** Pl. XIII, Figs. 5, 6, and 7.
venosa, Abantis, 254.
venustissima, Pacidara, 274.
vesperalis, Acræa, 125.
vestalis, Oboronia ornata, 235.
vetusta, Euphædra, 177.
  Romalæosoma, 177.
vidua, Noctua, 268.
  Rhodogastria, 268.
vilis, Ctenogyna, 306.
vinidia, Acræa, 128.
violascens, Mycalesis golo, 137.
virescens, Elæodes, 284.
  Eremobia, 284.
  Pseudonotodonta, 297.
virgo, Hyreus, 230.
viridis, Carpostalagma, 269.
  Caryatis, 269.
vittalbata, Xanthospilopteryx, 271.
viviana, Acræa, 127.
vivida, Nyssia, 323.
  Parasa, 323.
vologeses, Charaxes, 211.
  Palla, 211.
vulgaris, Mycalesis, 141.
vulgaris tolosa, Mycalesis, 141.
vulgaris U, Byblia, 158.

walkeri, Nyctipao, 277.
  Patula, 277.
warburgi, Pseudacræa hostilia, 164.
welwitschii, Belenois, 239.
westermanni, Atemnora, 302.
  Junonia, **145,** 146.
  Precis, 145, 146.
Westermannia digramma, 276.
westermannii, Macroglossa, 302.
weymeri, Cymothoë, 197.
wœrdeni, Phalera, 305.
  Rigema, 305.
wœrmanni, Tagiades, 251.
wollastoni, Ceratrichia, 260.

xanthospila, Anoa, 297.
  Mylantria, 297.
Xanthospilopteryx, 270.
  æmulatrix, 270.
  batesi, 270.
  flaviventris, 270.
  gruenbergi, 271.
  mabillei, 270.
  medjensis, 117, **271.** Pl. XIII, Fig. 1.
  paucicolor, 271.
  poggei, 270.
  vittalbata, 271.
xeneas, Mycalesis, 133.
Xyleutes, 319.
  sjœstedti, 319.
Xynthospilopteryx batesi, 270.

xypete, Euphædra, 116, 168, 178.
    Romalæosoma, 178.
xypete maxima, Euphædra, 116, **178.**

Ypthima, 142.
    asterope, 142.
    doleta, 142.
    itonia, 142.
    simplicia, 142.

zalmoxis, Papilio, 244.
Zamarada, 309.
    protrusa, 309.
zambesiaca, Abantis, 254.
zambezina, Abantis, 254.
Zebronia, 327.
    phenice, 327.
zelica, Charaxes, 210.
zenobia, Papilio, 245.
Zeritis aderna, 225.
    fallax, 225.
    latifimbriata, 225.
zetes, Acræa, 130.
    Papilio, 130.
Zeuzera boisduvalii, 319.
Zinckenia, 327.
    recurvalis, 327.
zingha, Charaxes, 212.
    Monura, 212.
    Papilio, 212.
Zizera, 234.
    antanossa, 234.
    gaika, 234.
    lysimon, 234.
zoë, Terias, 243.
zonara, Aterica, 183.
    Euryphene, 182, **183.**
Zonilia fumosa, 301.
Zygæna guineënsis, 266.
    lethe, 265.
Zygænidæ, 324.
zymna, Megalopalpus, 218, 219, **220.**
    Miletus, 220.

59.53, 71 (67.5)

Article VII.—AMPHIPODS COLLECTED BY THE AMERICAN MUSEUM CONGO EXPEDITION 1909-1915[1]

By Clarence R. Shoemaker

6 Text Figures

The order Amphipoda is represented in this collection by six species which are included in six genera of the families Gammaridæ, Talitridæ, and Ampithoidæ. All were obtained along the seacoast and, as would be expected from a shore or beach collection, Talitridæ contains the greatest number of genera, species, and individuals. Two species, *Elasmopus congoënsis* and *Talorchestia tricornuta*, are new to science. The types are deposited in The American Museum of Natural History.

GAMMARIDEA

Gammaridæ

Elasmopus congoënsis, new species

Eleven specimens were taken at St. Paul de Loanda, Angola. Portuguese West Africa.

Male.—Head: lateral lobes truncated with upper and lower corners broadly rounded; eyes oval, narrower above than below.

Antenna 1 about two-thirds length of body; first and second joints equal in length, third over half the length of second; flagellum subequal in length to the peduncle and composed of twenty-five to thirty joints; accessory flagellum two-jointed, short, not reaching end of second joint of primary. Antenna 2, two-thirds length of antenna 1; flagellum about two-thirds length of peduncle and composed of thirteen joints.

Mouth-parts normal. Maxilliped with the inner distal end of third joint of palp produced into a blunt lobe which is covered with minute tubercles.

Side-plate 1 produced slightly forward, front margin a little concave, lower anterior corner broadly rounding. Gnathopod 1: sixth joint oval; palm and hind margin continuous, palm defined by a single spine and armed throughout with two rows of small spines. Gnathopod 2 very robust; sixth joint very long, broad as fifth joint at base and converging toward the much narrower apex; palm undefined but probably represented by a long, narrow groove into which the long, curved dactyl fits; a truncated, forward-pointing tooth upon the inner margin of this groove a little beyond the center; a low blunt tooth armed with three spines on each side just under the dactyl hinge; dactyl strong, with a low protuberance on the inner side resting between the two palmar teeth which rest against the side of dactyl when it is closed.

---

[1] Scientific Results of The American Museum of Natural History Congo Expedition. General Invertebrate Zoology, No. 5.

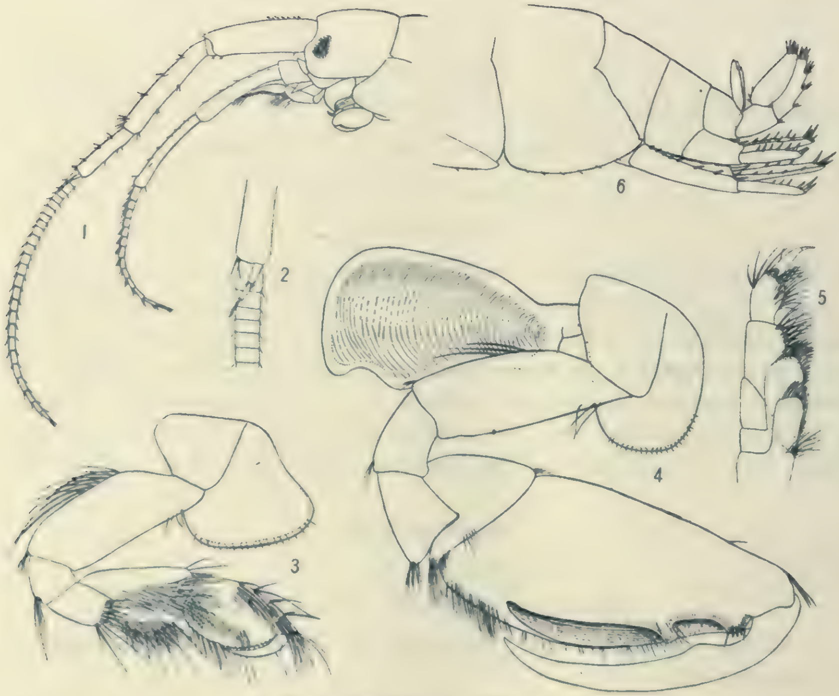


Fig. 1. ***Elasmopus congoënsis,* ♂.**

1.—Head and antennæ. 2.—Accessory flagellum enlarged. 3.—Gnathopod 1 ♂, left side, inside view. 4.—Gnathopod 2 ♂, left side, inside view. 5.—Maxilliped showing distal lobe of third joint of palp. 6.—Pleon, uropods, and telson.

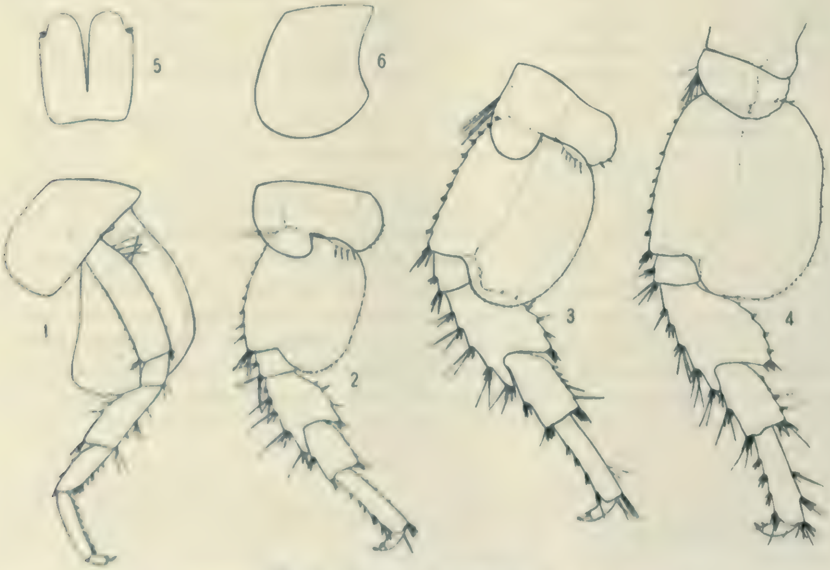


Fig. 2. ***Elasmopus congoënsis,* ♂.**

1.—Peræopod 1. 2.—Peræopod 3. 3.—Peræopod 4. 4.—Peræopod 5. 5.—Telson. 6.—Side-plate 4

Peræopods 1 and 2 normal. Peræopod 3 short and stout; its side-plate bilobed, front lobe deeper than hind lobe; second joint expanded posteriorly into a broad lobe with hind margin nearly straight; fourth joint broad with lower front margin produced downward nearly to the middle of the fifth joint; dactyl strong with short spine near middle of inside edge. Peræopod 4 about like 3 but a little longer; lower front corner of fourth joint produced to only about one-third the length of the fifth joint. Peræopod 5 a little longer than 4; lower margin of side-plate evenly curved, posterior half deeper than anterior; rest of limb closely resembling peræopod 4.

Posterior margin of pleon segment 2 with small notch just above lower posterior corner; pleon segment 3 with lower half of posterior margin somewhat crenulate, slight notch just above the lower posterior corner.

Uropod 1 extending very little beyond uropod 2; inner ramus longer than outer and subequal to peduncle; rami armed at their distal ends with several long spines, and the margins of rami and peduncle armed with short spines; a long, slightly curved, backward-pointing spine on the inner distal corner of peduncle. Uropod 2 with inner ramus longer than outer and slightly longer than peduncle, outer ramus subequal to peduncle; rami armed at their distal ends with several long spines and along their edges with shorter ones. Uropod 3: rami subequal, longer than peduncle, broad and truncated, extending beyond uropods 1 and 2, truncated ends beset with long straight spines, outer edge of outer ramus armed with three groups of spines, inner edge of inner ramus with two or three small spines near base.

Telson a little longer than broad, cleft nearly to its base; apex of lobes evenly rounded; notch containing several small spines on outer margin about one-fourth the distance from the distal end.

Length.—10 mm.

Female.—In general like male. Gnathopod 1 like that of male. Gnathopod 2: sixth joint as wide as fifth and twice as long; palm very oblique, about one-half as long as joint and beset with fine spines. Peræopods about as in male, but the third, fourth, and fifth pairs are not so stout.

Length.—8 mm.

Talitridæ

Talorchestia tricornuta, new species

Fifty specimens were taken at Banana, Belgian Congo, and thirty-nine specimens at St. Antonio, Angola.

Male.—Eyes black, large, circular, and nearly meeting at top of head.

Antenna 1 not quite reaching to the end of the fourth joint of peduncle of antenna 2; first joint of peduncle short, second a little longer, third about twice the length of the first; flagellum about equal to the length of the third joint of peduncle and composed of three or four joints. Antenna 2 about one-third the length of the body; flagellum equal to the length of the peduncle and composed of nineteen or twenty joints.

Maxillipeds with inner plates long and truncated, distal ends and inner margins armed with long curved spines; outer plates short and oval and provided on their ends with curved spines; palp three-jointed, second joint expanded on its inner margin into a forward-pointing lobe; inner edge of the second and the inner edge and end of

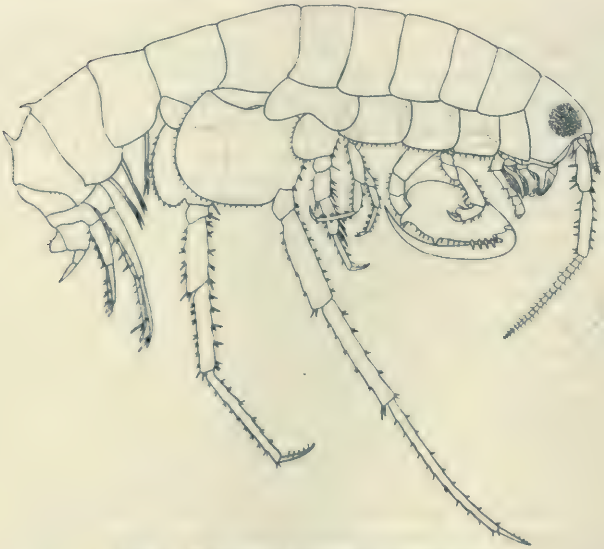


Fig. 3. *Talorchestia tricornuta*. Mature male.

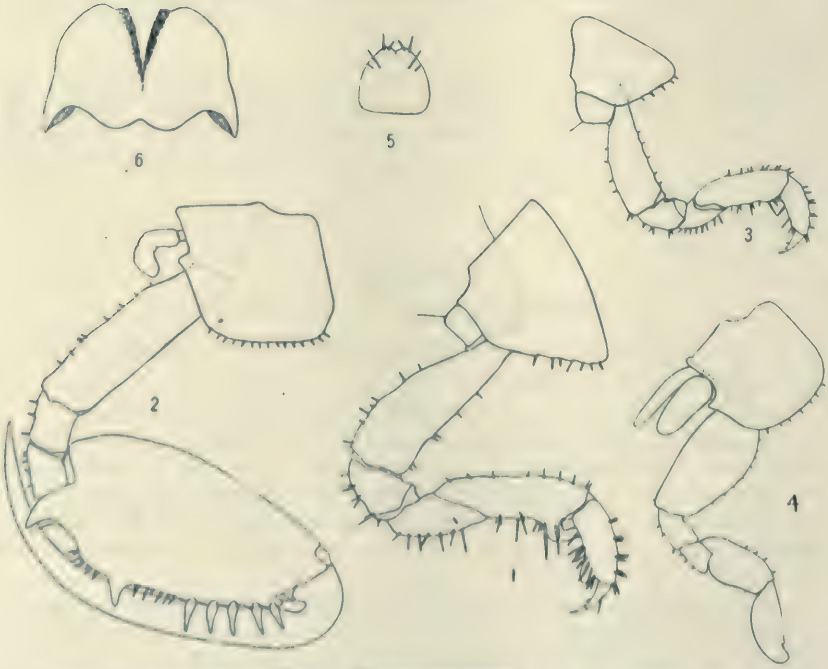


Fig. 4. *Talorchestia tricornuta*.

1.—Gnathopod 1 ♂. *2*.—Gnathopod 2 ♂. *3*.—Gnathopod 1 ♀. *4*.—Gnathopod 2 ♀. *5*.—Telson. *6*.—Lower lip the third joints provided with stout spines. Maxilla 1 with inner plate very narrow and provided at its distal end with two stout, setose, curved spines; inner plate broad with apex rounding and provided with several serrated spines; palp very small and composed of two joints, of which the second is very short. Maxilla 2 with a large, stout, setose spine on the middle of the inner margin of the inner plate; inner margin and apex of inner plate and apex of outer plate provided with long curved spines. Mandible with molar strong and provided on its posterior edge with a long pinnate seta; at base of molar is a blunt tooth-like protuberance. Lower lip normal.

Side-plates not as deep as their body segments and becoming successively wider up to the fifth, which is not as deep as the fourth. Side-plate 1 projecting forward slightly; lower anterior corner acute; lower margin with a few short setæ.

Gnathopod 1 with the lower, posterior corner of the fifth and sixth joints produced into a rounded lobe. Dactyl when closed reaching much beyond the lobe of the sixth joint. Gnathopod 2 with sixth joint large and strong; sixth joint long and oval with the palm occupying the entire posterior border; two large teeth, between which the long, curved dactyl rests, occupy the proximal end of the palm; palm with a single, forward-pointing tooth about one-third the distance from the proximal end, while five stout spines occupy the distal third; many smaller spines occupy the space between the last large spine and the two bounding teeth. The dactyl when closed fits against the palm and the fourth joint and in many specimens reaches to about the middle of the third joint. The five stout spines and the median tooth lie against the outside of the dactyl when it is closed against the palm.

Peræopod 1 slender; dactyl with two setæ on its inner margin. Peræopod 2 slender; dactyl with the usual notch, and a single seta on its inner margin. Peræopod 3 short; second joint with posterior border expanded into a rounding lobe; fifth joint provided on its anterior edge with four groups of long, downward-pointing spines; dactyl provided on its inner surface with two setæ. Peræopod 4 very long, about the length of the body; side-plate with posterior portion produced into a downward-projecting lobe bearing several small spines; second joint greatly expanded backwards and upwards; fourth and fifth joints subequal in length; sixth joint longer than fifth; dactyl usually bearing four or five setæ on its inner edge. In the immature males peræopod 4 is not longer than peræopod 5 and the expansion of the second joint is no greater than that of the corresponding joint of peræopod 5. Peræopod 5 about two-thirds the length of 4, with second joint moderately expanded; dactyl usually with five or six setæ on its inner margin.

Lower posterior corners of the second and third pleon segments slightly produced; middle of posterior border of third segment provided with several small setæ; second segment provided at its posterior dorsal edge with two backward-pointing teeth, one on either side of the middle; third segment provided at the middle of its dorsal surface with a single forward-pointing tooth. These teeth are so arranged that when the pleon is straightened out the tooth of the third segment passes forward between those of the second. These teeth vary greatly in size and in the young males may be very inconspicuous or absent entirely.

Uropod 1 long and slender with rami equal in length to the peduncle; outer ramus slightly longer than inner; both peduncle and rami provided on their upper edges with spines; the outer ramus provided at its apex with two spear-shaped spines and one shorter straight spine, and the inner ramus with one spear-shaped, one long straight spine, and several short spines. Uropod 2 shorter than uropod 1;

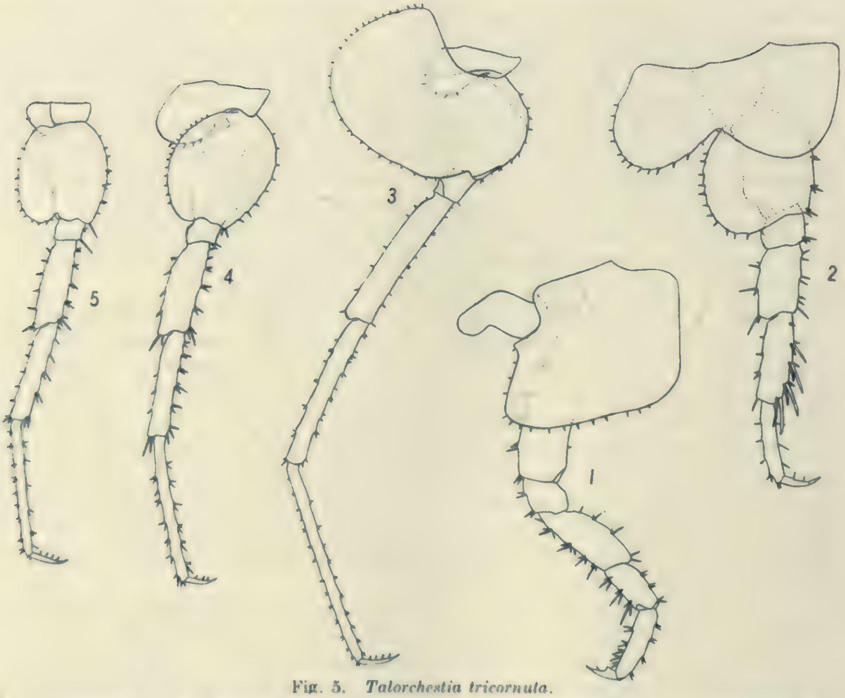


Fig. 5. *Talorchestia tricornuta.*
1.—Peræopod 2. *2.*—Peræopod 3. *3.*—Peræopod 4 ♂. *4.*—Peræopod 4 ♀. *5.*—Peræopod 5 ♂.

rami equal in length to the peduncle; outer ramus projecting very little beyond inner; upper edges of peduncle and rami provided with spines; outer ramus provided at its apex with one spear-shaped spine and several shorter ones; inner ramus provided at apex with one spear-shaped spine, one long straight spine and one shorter one. Uropod 3 shorter than uropod 2; ramus a little longer than peduncle and armed at its apex and along its upper edge with a few straight spines.

Telson short and tumid with sides convex and converging toward the bluntly bilobed apex; each lobe provided at its apex with one long and one short spine; one long and several shorter spines on either side of upper surface about one-third the distance from the end.

Length.—11 mm.

Female.—Like the male except as follows. Fifth and sixth joints of gnathopod 1 without lobe. Gnathopod 2 with second joint moderately expanded in front; fifth joint with lower margin expanded into a broad, tumid lobe, sixth joint expanded behind into a broad, tumid lobe which projects beyond and slightly in front of the weak dactyl which is situated on the front margin about one-fourth the distance from the distal end. Peræopod 4 similar in form and length to peræopod 5 which is similar to the corresponding appendage of the male. Second and third joints of pleon without dorsal teeth.

Length.—8 mm.

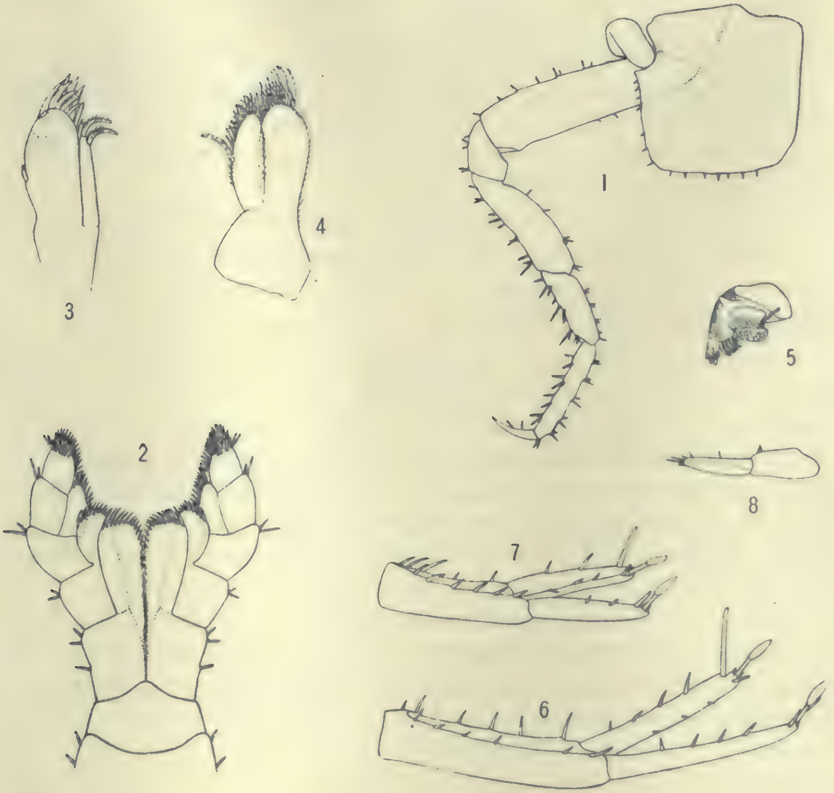


Fig. 6. *Talorchestia tricornuta.*
1.—Peræopod 1. *2.*—Maxillipeds. *3.*—Maxilla 1. *4.*—Maxilla 2. *5.*—Mandible. *6.*—Uropod 1. *7.*—Uropod 2. *8.*—Uropod 3.

Orchestia platensis Kroyer

One specimen was taken at Banana, Belgian Congo, and five specimens are from St. Antonio, Angola.

This species has not previously been reported from the west coast of Africa but has been found in the Mediterranean, the Maldive Archipelago, banks of the Rio de la Plata, Atlantic coast of North America, West Indies, Bermudas, Azores, and Hawaii. It will probably be found to be a cosmopolitan species.

Hyale prevostii (Milne-Edwards)

Twenty-three specimens were taken at Banana, Belgian Congo.

These specimens differ somewhat from the description given by Stebbing in 'Das Tierreich.' The antennæ have a greater number of joints in their flagella, and uropod 1 has a rather stout spine at the distal end of the peduncle between the rami.

H. nilssoni has been reported from the Maldive Archipelago by A. O. Walker, and Stebbing believes this species to be the same as *H. prevostii*. *H. prevostii* has also been taken at the Azores, Sokotra, the Mediterranean, and Ceylon.

Ampithoidæ

Ampithoë species

A single female was taken at St. Paul de Loanda, Angola. Its specific identification would be quite doubtful, as the characters of many of the females of this genus are very obscure and quite inadequate for such a purpose.

Grubia species

There are two females from St. Paul de Loanda, Angola, but the characters of the females in this genus, as in the preceding, are insufficient for specific identification.

59.53,842(67.5)

Article VIII.—THE BRACHYURAN CRABS COLLECTED BY THE AMERICAN MUSEUM CONGO EXPEDITION, 1909–1915[1]

BY MARY J. RATHBUN

ECOLOGICAL AND OTHER NOTES[2] BY HERBERT LANG

PLATES XV TO LXIV, 22 TEXT FIGURES, 1 MAP

INTRODUCTION

The collection of brachyuran crustaceans (nearly 3,000 specimens) obtained by Messrs. Lang and Chapin is a large one, especially in relation to the brief period devoted to its acquisition. Although the number of marine, brackish-water, and terrestrial species obtained is only about a third of the total number known to inhabit the western coast of Africa,[3] or that faunal area extending from Senegal to Angola, yet the large series of many of the species enables us to define them with greater accuracy. Furthermore, the occurrence at the mouth of the Congo means in many cases an extension of the previously known range, and also adds five species to the marine fauna of the continent of Africa; two of these, *Geograpsus lividus* and *Pachygrapsus gracilis*, are American species; two others, *Menippe nanus* and *Cyclograpsus occidentalis*, were described from the Cape Verde Islands, while the third represents a new species of the extensive and unusually plastic genus *Sesarma*, viz., *S.* (*Chiromantes*) *alberti*.[4] Five new species were found among the river crabs, or Potamonidæ.

Plates XV, XVI, XVII, and LV to LXIV are from photographs made in the field by Mr. Herbert Lang. Plates XL and LIV were borrowed from the U. S. National Museum. Plates XVIII to XX, XXIII to XXXVI, and XLII are from photographs taken by Mr. Clarence R. Shoemaker and retouched by Mr. Seward H. Rathbun. The remaining plates were photographed at the American Museum. The drawings of the text figures were made by Miss Violet Dandridge, except Fig. 1*c* by Mr. Seward H. Rathbun.

---

[1] Scientific Results of The American Museum Congo Expedition. General Invertebrate Zoology, No. 6.

[2] These notes are indicated in the text by quotation marks and Mr. Lang's initials. Short field notes by Mr. Lang are also given in connection with the locality records.

[3] A list of the decapod crustaceans of western Africa between 16° north latitude and 17° south latitude, including the fauna not only of the coast but of the fresh waters tributary to the coast and of the neighboring islands, was published in 1900 in the Proceedings of the United States National Museum, XXII, No. 1199, pp. 271–316.

[4] Named for the King of the Belgians.

New Species, with their Type Localities

Page

Potamon (*Potamonautes*) *stanleyensis*. Stanleyville 415
“ (*Geothelphusa*) *congoënsis*. Gamangui 422
“ “ *perparvus*. Stanleyville 425
“ (*Acanthothelphusa*) *faradjensis*. Faradje 428
“ “ *langi*. Stanleyville 430
Sesarma (*Chiromantes*) *alberti*. Malela 448

List of Species Taken by the American Museum Congo Expedition

Dromia atlantica Doflein 393
Callinectes marginatus (A. Milne Edwards) 395
“ *gladiator* Benedict 397
“ *latimanus* Rathbun 398
Thalamita africana Miers 402
Potamon (*Potamonautes*) *floweri* de Man 406
‘ “ *dybowskii* Rathbun 410
“ “ *lirrangensis* Rathbun 413
“ “ *stanleyensis*, new species 415
“ (*Potamon*) *ballayi* (A. Milne Edwards) 419
“ (*Geothelphusa*) *congoënsis*, new species 422
“ “ *perparvus*, new species 425
“ (*Acanthothelphusa*) *faradjensis*, new species 428
“ “ *langi*, new species 430
Erimetopus brazzæ (A. Milne Edwards) 433
Deckenia mitis Hilgendorf 434
Menippe nanus A. Milne Edwards and Bouvier 436
Pilumnus verrucosipes Stimpson 437
Panopeus africanus A. Milne Edwards 438
Eurypanopeus blanchardi (A. Milne Edwards)? 440
Grapsus grapsus (Linnæus) 441
Geograpsus lividus (H. Milne Edwards) 442
Goniopsis cruentata (Latreille) 443
Pachygrapsus transversus (Gibbes) 444
“ *gracilis* (Saussure) 445
Sesarma (*Chiromantes*) *africanum* H. Milne Edwards 446
“ “ *alberti*, new species 448
“ (*Holometopus*) *büttikoferi* de Man 449
“ “ *angolense* Brito Capello 451
“ “ *elegans* Herklots 453
Sarmatium curvatum (H. Milne Edwards) 454
Cyclograpsus occidentalis A. Milne Edwards 455
Cardisoma armatum Herklots 456
Ocypode ippeus Olivier 461
“ *africana* de Man 462
Uca tangeri (Eydoux) 465
Pisa carinimana Miers 466

List of Localities, with Names of the Species Taken at Each

Avakubi
Potamon (*Potamonautes*) *dybowskii*
Bafwabaka
Potamon (*Potamonautes*) *dybowskii*
" (*Geothelphusa*) *congoënsis*
Bafwamoko
Potamon (*Potamonautes*) *dybowskii*
" " *stanleyensis*
Bafwasende
Potamon (*Potamonautes*) *dybowskii*
" (*Geothelphusa*) *congoënsis*
Banana
Callinectes marginatus
" *gladiator*
" *latimanus*
Potamon (*Potamonautes*) *floweri*
Panopeus africanus
Grapsus grapsus
Geograpsus lividus
Goniopsis cruentata
Pachygrapsus transversus
" *gracilis*
Sesarma (*Chiromantes*) *africanum*
" " *alberti*
" (*Holometopus*) *büttikoferi*
" " *elegans*
Sarmatium curvatum
Cyclograpsus occidentalis
Cardisoma armatum
Ocypode ippeus
" *africana*
Uca tangeri
Batama
Potamon (*Potamonautes*) *dybowskii*
Comarock (River near), Athi Plains, British East Africa
Deckenia mitis
Faradje
Potamon (*Potamonautes*) *floweri*
" (*Acanthothelphusa*) *faradjensis*
Garamba
Potamon (*Potamonautes*) *floweri*
Leopoldville
Potamon (*Acanthothelphusa*) *langi*
Erimetopus brazzæ
Libreville, Gaboon
Potamon (*Potamonautes*) *floweri*
" " *dybowskii*
" (*Geothelphusa*) *congoënsis*
Sesarma (*Chiromantes*) *africanum*
Lopez (Cape), French Congo
Ocypode ippeus
Malela
Sesarma (*Chiromantes*) *alberti*
" (*Holometopus*) *büttikoferi*
" " *angolense*
Sarmatium curvatum
Cardisoma armatum
Moanda
Callinectes marginatus
Grapsus grapsus
Goniopsis cruentata
Sesarma (*Holometopus*) *elegans*
Sarmatium curvatum
Cardisoma armatum
Ocypode ippeus
" *africana*
Uca tangeri
Nepoko River (Affluents of), near Gamangui (Ituri Forest)
Potamon (*Potamonautes*) *floweri*
" " *dybowskii*
" (*Geothelphusa*) *congoënsis*
Ngayu
Potamon (*Potamonautes*) *floweri*
" " *dybowskii*
Padron Point
Menippe nanus
Poko
Potamon (*Potamonautes*) *floweri*
" " *dybowskii*
" (*Geothelphusa*) *congoënsis*
San Antonio, Angola
Callinectes gladiator
Eurypanopeus blanchardi ?
Goniopsis cruentata
Pachygrapsus gracilis
Sesarma (*Chiromantes*) *africanum*
" " *alberti*
" (*Holometopus*) *büttikoferi*
" " *elegans*

Sarmatium curvatum
Ocypode ippeus
" *africana*
Uca tangeri
Pisa carinimana

Stanleyville

Potamon (Potamonautes) dybowskii
" " *lirrangensis*
" " *stanleyensis*
" *(Potamon) ballayi*
" *(Geothelphusa) perparvus*
" *(Acanthothelphusa) langi*

St. Paul de Loanda, Angola

Dromia atlantica
Callinectes marginatus
Thalamita africana
Pilumnus verrucosipes
Panopeus africanus
Pachygrapsus transversus
Pisa carinimana

Tshopo River (Affluents of), near Stanleyville

Potamon (Potamonautes) floweri
" " *dybowskii*
" " *stanleyensis*
" *(Potamon) ballayi*
" *(Geothelphusa) congoënsis*
" " *perparvus*

Vankerckhovenville

Potamon (Potamonautes) floweri
" *(Acanthothelphusa) faradjensis*

Yakuluku

Potamon (Potamonautes) floweri

Zambi

Sesarma (Holometopus) büttikoferi
" " *angolense*

Approximate Location of Places Mentioned in this Paper

Albert Edward L.—0° to 0° 30′ S., 29° 30′ E.
Aruwimi R.—1° 20′ N., 27° 40′ E.
Assinie.—5° N., 3° 20′ W.
Avakubi.—1° 20′ N., 27° 40′ E.

Bafwabaka.—2° 10′ N., 27° 50′ E.
Bafwamoko.—0° 40′ N., 26° 55′ E.
Bafwasende.—1° 10′ N., 27° 15′ E.
Bahr-el-Djebel.—7° 30′ to 9° 30′ N., 30° 15′ to 30° 40′ E.
Bahr-el-Gebel, see Bahr-el-Djebel.
Banana.—6° S., 12° 20′ E.
Banana Creek.—6° S., 12° 25′ to 12° 35′ E.
Bangui.—4° 25′ N., 18° 35′ E.
Batama.—1° N., 26° 40′ E.
Benguela.—12° 30′ S., 13° 20′ E.
Beyah R., Elmina, see Elmina.
Bird Island.—5° 55′ S., 12° 55′ E.
Boma.—5° 50′ S., 13° 10′ E.
Bomokandi R.—3° 45′ to 2° 50′ N., 26° 10° to 29° 45′ E.
Boutry.—4° 55′ N., 1° 50′ W.
Bulabemba.—6° 3′ S., 12° 28′ E.
Bulikoko Island.—6° S., 12° 45′ E.

Cape Lopez.—0° 40′ S., 8° 45′ E.
Chinchoxo.—5° 15′ S., 12° 15′ E.
Comarock, Athi Plains.—1° 20′ S., 37° 5′ E.

Dakar.—14 ° 40′ N., 17° 35′ W.
Daressalaam.—6° 50′ S., 39° 15′ E.
Dungu R.—4° 40′ N., 28° 35′ to 30° 40′ E.

Elmina.—5° 5′ N., 1° 30′ W.

Faradje.—3° 40′ N., 29° 40′ E.

Gamangui.—2° 10′ N., 27° 20′ E.
Ganschu, see Nganchu.
Garamba.—4° 10′ N., 29° 40′ E.
Gorée Bay.—14° 35′ N., 17° 30′ W.

Hippopotamus Island.—5° 55′ S., 12° 50′ E.

Ituri R.—1° 30′ N., 26° to 30° E.

Katala.—6° S., 12° 45′ E.
Kituri, Upper Lualaba.—5° 40′ S., 26° 55′ E.
Koloka.—3° 5′ N., 24° 35′ E.
Kunga.—5° 55′ S., 12° 35′ E.
Kwamouth.—3° 20′ S., 16° 10′ E.

Lagos.—6° 30′ N., 3° 25′ E.
Landana.—5° 15′ S., 12° 15′ E.
Leopoldville.—4° 25′ S., 15° 20′ E.
Libreville.—0° 25′ N., 9° 25′ E.
Lindi R.—1° 25′ N. to 0° 25′ S., 25° 5′ to 29° E.
Liranga.—0° 45′ S , 17° 45′ E.
Lobito Bay.—12° 25′ S., 13° 25′ E.
Lualaba R.—1° to 12° S., 25° to 27° E.

Malela.—6° S., 12° 40′ E.
Matadi.—5° 50′ S., 13° 35′ E.
Moanda.—5°55′ S., 12° 25′ E.
Moanda R., see Moanda.
Mombasa.—4° S., 39° 50′ E.
Monrovia.—6° 30′ N., 10° 50′ W.
Muserra.—7° 25′ S., 12° 55′ E.

Nairobi.—1° 5′ S., 36° 50′ E.
Nemlao.—5° 55′ S., 12° 30′ E.
Nepoko R.—2° 20′ to 1° 35′ N., 27° 35′ to 29° 20′ E.
Netona.—5° 55′ S., 12° 30′ E.
Nganchouno, see Nganchu.
Nganchu.—3° 18′ S., 16° 6′ E.
Ngancin, see Nganchu.
Ngayu.—1° 40′ N., 27° 40′ E.

Padron Point.—6° 5′ S., 12° 50′ E.
Plettenbergs Bay.—34° S., 23° 15′ E.
Poko.—3° 10′ N., 26° 50′ E.
Ponta da Lenha.—6° S., 12° 45′ E.

Rock Spring, Monrovia, see Monrovia.
Ruwenzori Mt.—0° 30′ N., 29° 50′ E.

San Antonio.—6° 10′ S., 12° 20′ E.
Shiloango R.—5° S., 12° to 13° E.
Simons Bay.—34° 10′ S., 18° 25′ E.
Spring Rock, Monrovia, see Monrovia.
Stanley Pool.—4° 15′ S., 15° 30′ E.
Stanleyville.—0° 30′ N., 25° 15′ E.
St. Paul de Loanda.—8° 55′ S., 13° 10′ E.

Tanga.—5° 5′ S., 39° 5′ E.
Tanganyika L.—3° to 9° S., 29° to 31° E.
Tshopo R., see Stanleyville.

Ubangi R.—0° to 5° N., 18° to 23° E.
Uele R.—3° 30′ N., 23° to 30° E.

Vankerckhovenville.—3° 20′ N., 29° 20′ E.

Wembere Steppe.—4° 10′ S., 34° 15′ E.

Yakuluku.—4° 20′ N., 28° 50′ E.
Yei R.—6° 35′ to 3° 50′ N., 30° 20′ to 30° 45′ E.

Zambi.—6° S., 12° 50′ E.

Callinectes FROM THE MOUTH OF THE CONGO

Among the species from the mouth of the Congo, those of the genus *Callinectes* are the most important in the collection, as they have been hitherto little known. Four species inhabit the West African coast. One was discovered more than a century ago during the earliest expedition to the Congo, for in Appendix No. IV to the 'Narrative of an Expedition to explore the River Zaire, usually called the Congo, in South Africa, in 1816, under the direction of Captain J. K. Tuckey, R. N.,' London, 1818, Leach says, under *Lupa* [=*Neptunus* of authors, with which *Callinectes* was early combined]: "Of this genus three new species were discovered, all of which belong to that section in which the hinder lateral spine of the shell is very much elongated." Leach never published descriptions of these species but some specimens labeled by him are in the British Museum; his *Lupa smythiana* is identical with *Callinectes gladiator*, while his *L. cranchiana* is not a *Callinectes*, but is equivalent to *Portunus* (= *Neptunus*) *sayi*, and the identity of his third species is unknown.[1]

Three species of *Callinectes* are present and are well represented in the American Museum collection; a fourth is figured in color by A. Milne Edwards and Bouvier, 1900,[2] and by Gruvel in 1912,[3] under the name of "*Callinectes diacanthus* var. *africanus*." This seems to be more closely related to *C. sapidus* (= *hastatus*), the common edible crab of the Atlantic coast of America, than to any other species; it has only two teeth instead of four on the frontal margin between the antennæ, and the shape of all the teeth and spines and the disposition of the granules are similar to those of *C. sapidus*. On the other hand, the intramedial region is shorter, as are the chelipeds also.[4] The writer doubts that the name "*africanus*" is correctly applied to this form. *C. africanus* was first described by A. Milne Edwards[5] in 1879 from the Cape Verde Islands. In 1896 the writer examined in Paris what she supposed were the type specimens of *africanus*, although they were not labeled ‘types,” and came to the conclusion that they were synonymous with *marginatus* and *larvatus*.

THE LAND CRABS, OR CARDISOMAS

The bulkiest part of the collection is formed by the land crabs, of which 120 specimens were collected, enough to demonstrate that certain differences between the African species, *Cardisoma armatum*, and the American species, *C. guanhumi*, are constant. It has not yet, however, been proved that *armatum* is the sole representative of the genus in western Africa, as it is claimed by some authors that the true *guanhumi* does exist there.

THE RIVER CRABS, OR POTAMONIDÆ

By far the most important part of the results of the Museum's expedition, in the line of decapods, is the group of river crabs (Potamonidæ) which inhabit the Congo and its tributaries and their banks.

---

[1] This information has been obtained through Dr. W. T. Calman who has kindly examined such of Leach's specimens as remain in the British Museum.

[2] Expéd. Sci. du Travailleur et du Talisman, 1880–1883, Crust. Déc., 1ère partie, Paris, p. 71, Pl. iv, fig. 5.

[3] Ann. Inst. Océanog., V, fasc. 1, pp. 5, 6 and 11, Pl. ii, fig. 1.

[4] May not the specimen found in a basin at Rochefort, France (See Bouvier, 1901, in Bull. Mus. Paris, VII, p. 16) be this species and have emigrated from the West African instead of the American coast?

[5] 1879, Crust. Rég. Mex., p. 229.

Distribution of African River Crabs

Half of the African species of the family Potamonidæ are referable to the subgenus *Potamonautes* of the genus *Potamon*. This subgenus is said to be restricted to Africa, but *Potamon fruhstorferi* Balss,[1] from Annam, French Indo-China, has every indication of belonging to *Potamonautes* and was placed in that subgenus by its author.

Potamon (*Geothelphusa*) ranges from western Africa to eastern Africa, including Madagascar (*P.* (*G.*) *ankaraharæ* Nobili),[2] to northern Africa, and through southern Asia (Indian peninsula excluded) to Japan; Australia (?).

Potamon, the typical subgenus of *Potamon*, is scantily represented on the continent of Africa, although Madagascar yields a number of species. Two typical species inhabit northern and northeastern Africa respectively and extend, one into southern Europe, the other into western Asia. The three Potamons of middle Africa (*didieri*, *nigrensis*, and *ballayi*) are all atypical and have much in common, the first and second, with *Potamonautes*, the third with *Geothelphusa*.

Acanthothelphusa, one of the subgenera of spined Potamons, is known from northeastern and middle Africa and southern Asia (peninsular India excepted). Seven species inhabit the Congo district; another (*niloticus*) extends from Egypt to British East Africa; still another (*chaperi*) inhabits Assinie on the Ivory Coast; while *antongilensis* is restricted to the island of Madagascar.

Platythelphusa (three species) is peculiar to Lake Tanganyika.

Hydrothelphusa (one species) is restricted to Madagascar.

Erimetopus (one species) inhabits the Congo.

Of the genus *Deckenia*, two species are found in East Africa, one in the Seychelles.

Cylindrotelphusa, of the subfamily Gecarcinucinæ, is said by Alcock[3] to live in peninsular India and New Guinea; two West African species should be referred to the genus, *C. macropus* from Liberia and *C. perrieri* from the Congo.[4]

---

[1] 1914, Zool. Jahrb., Syst., XXXVII, p. 403, text-figs. *A*, *B*, *C*, Pl. xv, fig. 2.

[2] 1906, Boll. Mus. Zool. Anat. Torino, XXI, No. 532 [pp. 1–4], text-figs. *A–C*.

[3] 1910, Rec. Indian Mus., V, p. 259.

[4] Bouvier, 1917, Comptes Rendus Acad. Sci. Paris, November 12, CLXV, p. 658, doubts the locality of *perrieri* because of the absence of a collector's name from the label and would consider *Cylindrotelphusa* wholly Indo-Australian. The occurrence of *C. macropus* in Liberia is, however, indisputable.

List of Congo Potamonidæ

SUBFAMILY POTAMONINÆ

Potamon (*Potamonautes*)
- *africanus* (A. Milne Edwards). Cameroon; French Congo.
- *aloysii-sabaudiæ* Nobili. Mt. Ruwenzori.
- *aubryi* (H. Milne Edwards). Guinea; Cameroon; French and Belgian Congo.
- *decazei* (A. Milne Edwards). Togo; Cameroon; Island of Fernando Po; French Congo.
- **dybowskii* Rathbun. French and Belgian Congo.
- **floweri* de Man. Soudan; French and Belgian Congo.
- **lirrangensis* Rathbun. Belgian Congo.
- *lueboensis* Rathbun. Belgian Congo.
- *pobeguini* Rathbun. Spanish Guinea; Cameroon (?); French Congo.
- *regnieri* Rathbun. French Congo.
- **stanleyensis*, new species. Belgian Congo.

Potamon (*Potamon*)
- **ballayi* (A. Milne Edwards). French and Belgian Congo.
- *didieri* Rathbun. Abyssinia; British East Africa; Belgian Congo.

Potamon (*Geothelphusa*)
- **congoënsis*, new species. Belgian Congo.
- *emini* (Hilgendorf). Abyssinia; British East Africa; German East Africa; Belgian Congo.
- **perparvus*, new species. Belgian Congo.

Potamon (*Acanthothelphusa*)
- *campi* Rathbun. Belgian Congo.
- *chavanesii* (A. Milne Edwards). Cameroon; French and Belgian Congo.
- **faradjensis*, new species. Belgian Congo.
- **langi*, new species. Belgian Congo.
- *marchei* (Rathbun). French Congo.
- *pœcilei* (A. Milne Edwards). French Congo.
- *schubotzi* Balss. Belgian Congo.

Erimetopus **brazzæ* (A. Milne Edwards). French and Belgian Congo.

SUBFAMILY GECARCINUCINÆ

Cylindrotelphusa perrieri (Rathbun). Congo.

Relations of Congo Potamonidæ

Two species from the above list do not belong to the fauna of the Congo Valley, but are in the Belgian Congo; one of these (*aloysii-sabaudiæ*) occurs only at Mt. Ruwenzori, and one (*emini*) in Lake Albert-Edward-Nyanza, as well as farther east. Of the twenty-five species enumerated, seventeen are restricted to the valley of the Congo and its tributaries. Of those with wider range, four species occupy other watercourses farther up the western coast of Africa, one (*P. decazei*) reaching as far north as Togo, Guinea. Two species, only, show a connection between the Congo and northeastern or eastern Africa; the distribution of *P. floweri* in the upper Nile Valley and throughout west-central Africa is comparable to the distribution of many (nearly 100) species of freshwater fishes. (See Nichols and Griscom, 1917, Bull. Amer. Mus. Nat. Hist., XXXVII, p. 740.) *P. didieri* of the upper Congo has been found elsewhere only in British East Africa (Nairobi) and Abyssinia.

---

*Represented in the American Museum collection.

GENERAL ECOLOGY OF THE CONGO ESTUARY[1]

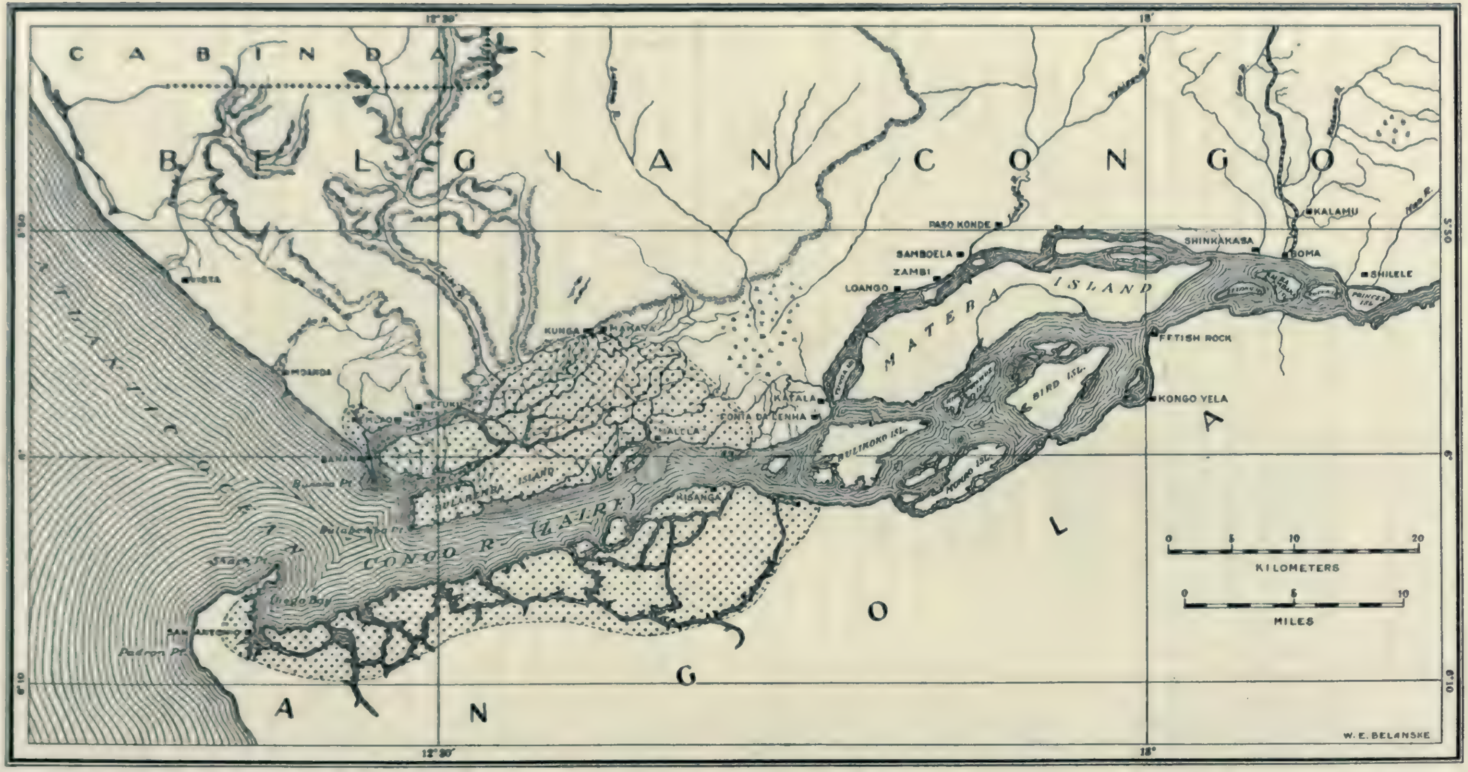
"The crabs from the Lower Congo dealt with in this paper were collected chiefly at Zambi, Banana, Bulabemba, and in mangrove swamps north and east as far as Moanda, Kunga, and Malela. Fortunately I was in this region at the most opportune time, the dry season, from the middle of June to the beginning of September 1915. Then the crabs were more concentrated in places still retaining sufficient moisture, for the water was at its lowest and rain scarce. A week was spent on the southern, or Portuguese, side of the river, near Padron Point and San Antonio, where the conditions seemed less favorable for crabs.

"From the hillside just north of Banana, at the edge of the Savannah, one can embrace with a glance the great estuary of the Congo (Map, p. 388). Along both sides of the main channel extend great areas of low-lying mangrove swamps, separated into many islands and inundated by the tides (Pls. LVIII, LIX, and LX). The biota of the immediate neighborhood of the river proper, practically to the mouth, is that of fresh water. At Zambi, where conditions are not brackish enough for the growth of mangroves, we found on the trip down-river that the crabs commenced to be common and gregarious in some of the papyrus and reed swamps on nearby islands.

"The mouth of the river is only six miles wide and, naturally, the force of the current is so great that most minor forms of marine life have no chance to flourish along its ruthless course. Sixty miles from the coast the billowing brown waters of the Congo still pollute the transparent emerald of the ocean. Hardly weakened by estuarine shallows, the mighty river, in a single broad channel, drives its silt-bearing floods like a huge wedge into the crystal-clear, white-crested deep. Near Bulabemba Island even ocean steamers are rocked as by a heavy gale, due to the powerful struggle of over half a billion gallons of water dashed every minute against the Atlantic surf.

---

[1] In the preparation of the ecological notes relating to the estuary of the Congo and of the captions to Plates LV to LXIV, I have had the benefit of the criticism and advice of Dr. J. Bequaert, who has made an extensive botanical survey of the Lower Congo.—H. L.


CABINDA
BELGIAN CONGO
ANGOLA
ATLANTIC OCEAN
CONGO R. (ZAIRE)
MATEBA ISLAND
BIRD ISL.
BULIKOKO ISL.
MONKO ISL.
PRINCES ISL.
BULABEMBA ISLAND
KUNGA
MAKAYA
KATALA
PONTA DA LENHA
MALELA
KISANGA
PASO KONDE
SAMBOELA
ZAMBI
LOANGO
SHINKAKASA
BOMA
KALAMU
SHILELE
FETISH ROCK
KONGO VELA
ETUKU
MOANDA
BANANA
Banana Pt.
Bulabemba Pt.
Shark Pt.
Diego Bay
SAN ANTONIO
Padron Pt.
12°30'
13°
5°50
6°
6°10
0
5
10
20
KILOMETERS
0
5
10
MILES
W. E. BELANSKE

Map of the estuary of the Congo River showing localities where crabs have been collected. The dotted areas cover the extent of true mangrove forest (*Rhizophora Mangle* Linnæus), being the region periodically inundated by saline water at high tide.

"Banana peninsula is a mere sandy tongue less than a mile long and only a few hundred yards wide. Sand bars stretching southward into the mouth of the Congo practically shut off the waves of the Atlantic at this point, and the result is a rather quiet bay (Pl. LVI, fig. 1). Here the salinity of the water is slightly reduced and the environmental conditions are sufficiently different from those on the surf-beaten Atlantic shores to allow a distinctive fauna both on the beach and in the water. To the southeast, Bulabemba Island and adjoining mangrove swamps form a divide between the rush of fresh water in the main channel and the creeks of various salinity. In certain parts of the more extensive mangrove swamps the ground is densely pitted with thousands of holes, the entrances to the burrows of the crabs. One or two species generally predominate, though naturally a few other forms may be met with in suitable places.

"The chief ecological conditions associated with different kinds of crabs at the mouth of the Congo or a few miles up-river are more varied than a superficial estimate might promise. They include fresh or salt water or a mixture of both; quiet, shallow coves or wave-battered Atlantic shores; mangrove jungles, *Raphia* swamps and tangles of *Pandanus* roots; firm bases of papyrus and grass tussocks (Pl. LXI) tunneled as runways and resting places; gaps in stone heaps or the recesses in laterite boulders; a thin line of drift an inch high; decayed hollow shoots and branches still covered with bark; firm sand flats submerged at high tide (Pl. LV, fig. 2); the water-soaked level several feet below the burning hot sand or beneath mud baked as hard as rock; the oozy mire or morasses so deep that man becomes helpless in them; the tough, peat-like mass the mangroves have built up; impenetrable stockades of well-anchored prop-roots (Pl. LVI, fig. 2); the lofty outlook above the water on branch or root; and, not the least of them, the water, a safe resort making escape doubly easy.

"Whenever ecological conditions of a particular type are prevalent, crabs of one kind are apt to be more common and are often gregarious. The naturalist must then be satisfied with quantitative results rather than qualitative, for no extraordinary variety of species could be expected in sites which are fairly uniform. Typical of this are the mangrove swamps, though mud is by no means the only habitable medium they offer. A considerable amount of slowly decaying vegetable matter is held fast among the roots, and other plants also secure a firm hold. The ever recurring tides with the various changes in the level of the water, in both dry and wet seasons, must keep some of the crabs busy to remain in close touch with the moisture. There seems to be little competition and, were it not for extensive colonies of the mollusk *Potamides*, crabs would be the chief inhabitants of all the inundated portions of these swamps. Wherever those mollusks cover the ground with their shells, often half buried in the mud, crabs are scarce. This seems to be due not to any obvious difference in behavior but rather to the fact that certain areas, especially in the neighborhood of lagoons, are so favorable for the mollusks that the crabs simply have no chance.

"As to the habits of crabs living among mangroves, it would be erroneous to characterize them either as diurnal or nocturnal. Their busy hours are as variable as the tides, for in many cases when the water recedes a new supply of food is available. The tides of course are a considerable factor and at Malela the difference in the water level generally amounts to three or four feet; during the equinoxes their action can be felt even as far as Boma (about 45 miles from the mouth of the river).

"The question of the factors regulating the dispersal of crabs in the Lower Congo necessarily involves a sketch of the general ecological conditions in this coastal region, with special emphasis upon the extent and peculiarities of their most important habitat, the mangrove swamps.

"The estuary of the Congo in its last twenty miles consists of a single channel practically free of any obstruction; there are no sand banks, no delta formation, and no masses of floating material large enough to be called islands. Even up-stream the latter are unimportant and those torn away by floods can not pass without destruction the numerous waterfalls of the 240-mile cataract region below Stanley Pool. The generally dense shore vegetation, the relative shallowness of the river bed, and the force of the current in the narrow channel south of Kwamouth would rapidly break up any drifting pieces of land. Such tussocks and bushes as one might find afloat in the Lower Congo could only come from the 90-mile stretch below Matadi, and may only be considered in the transportation of smaller creatures such as crustaceans.

"The seacoast proper on both sides of the mouth of the Congo River shows slight variation, since a short distance beyond the wave-swept and inundated portion the typical Savannah commences. From Banana northward to Moanda and beyond the wave-battered portion, the seashore extends as a narrow, barren strip of shifting sand at an incline rarely exceeding 30°, while on the Angolan coast it often amounts to 50° and more. Undoubtedly this difference is the result of the more vigorous action of the surf, which appears like a white crested wall ten to fifteen feet in height. Though swamps and sand flats are contiguous, no formation of dunes could be observed.

"The halophilous shore vegetation, which generally creeps up to or across the line of drift, appears more varied on the Angolan side. There, too, beyond the reach of salt water, dense groves of *Borassus* palms and *Sansevieria* are common (Pl. LV, fig. 1). On and near Banana peninsula *Phœnix* palms are abundant (Pl. LVII, fig. 1) and these sites are generally frequented by land crabs only, whereas several species of shore crabs live on the nearby sandy beach.

"Coral reefs are unknown along the Belgian shore but on the Angolan side several miles south of Padron Point such a formation commences, introducing a richer crustacean and molluskan fauna, just as is the case with the small field of laterite blocks below the lighthouse at Moanda near the base of the precipitous wall of red laterite soil (Pl. LVII, fig. 2).

"Though mangroves are common in similar tropical regions, in the Congo estuary they are especially vigorous and seem to rival those of Malaysia in size. The gigantic trunks attain seventy-five feet in height and more than two feet in diameter, and are cut at Malela into splendid boards and beams. In the mangrove swamps a considerable number of creeks of various widths make access by rowboat easy. At high tide, from a distance, the mass of dark green leaves glistening in the sun, the gray and brown streaks of aërial roots, and portions of trunks give the impression of a uniformly luxuriant growth of bushes and forests (Pl. LVIII). At low tide, the tangle of stilt-roots, anchoring the whole firmly into the mud, are forced on the attention (Pl. LIX). They help consolidate, or at least hold fast, the slush, débris, and sand, and thereby offer a home of perfect safety to millions of crabs that need not burrow far. The prop-roots of these extensive and often dense mangrove forests, and those of *Pandanus* (Pl. LXII), tangled and entwined, form an impenetrable stockade often fringed by *Raphia* palms (Pl. LX, fig. 1). Here at low tide the soft miry edges and slanting roots are the preferred hunting grounds of small troops of walking fish (*Periophthalmus*).

"According to Dr. Bequaert, the common mangrove of the Congo swamps is the *Rhizophora Mangle* Linnæus. Wherever at high tide the ground is regularly covered by salt or brackish water, they flourish together with their halophilous associates, generally not within the reach of heavy waves. On the Belgian shore the mangrove belt extends about 18 miles up-stream from Banana. On the Angolan side the considerably narrower strip reaches farther west and extends up-river about 28 miles, but the mangroves do not seem to attain as great a size as on the Belgian shore; this is true also of the patches at the mouth of the Moanda and Shiloango Rivers." (H. L.)

COLLECTING AND PRESERVING

"The greatest drawback in collecting crabs is the habit they have of shedding their limbs the very instant they are caught. In the field one usually kills them by injecting beneath their recurved abdomen some preserving fluid, which is most effective when forced into the slightly raised portion along the center. But too often in the creature's last spasms, chelipeds and legs are snapped off at certain points beyond the joints. Some species are more apt to do this than others and there is a great difference in the manner in which the young and fully adult react. Of the crabs represented in the collection, the adults of *Cardisoma armatum* are least liable to autotomize, but in the genus *Ocypode* the young were less subject to self-mutilation than the adult. *Grapsus grapsus, Goniopsis cruentata, Sesarma* (*H.*) *africanum,* and *S.* (*H.*) *elegans* were in this respect the most difficult to deal with.

"To overcome partly these difficulties one should avoid touching the crabs directly. After allowing them to retreat into their refuges, they may be enveloped within a quantity of the substance in which they are hiding, be it vegetable débris, mud, sand or soil, or held down below the gravel or in the crevices. They can then be injected just as easily and, with this method, limbs are seldom dropped off. Perfect specimens can also be obtained by exposing the crabs to the sun, which kills them quickly, or by drowning.

"In some crabs a rapid injection of a solution of 40 per cent formaldehyde mixed with half the quantity of 90 per cent alcohol gave the most satisfactory results. In tropical climates the large claws should be specially injected before the specimen is permanently preserved in 70 per cent alcohol. If glass jars are used, care should be taken to open them every day for the first week, as gases form and develop sufficient pressure to break the containers." (H. L.)

SYSTEMATIC DISCUSSION OF SPECIES COLLECTED

Tribe **Brachyura**

Subtribe **Dromiacea**

Dromiidæ

Dromia Weber

Dromia Weber, 1795, Nomenclator entomologicus, p. 92.

Dromia atlantica Doflein

Plate XVIII, Figure 3; Text Figure 1

Dromia atlantica Doflein, 1904, Brachyura 'Valdivia' 1898–1899, VI, p. 10; Atlas, Pl. vii, figs. 3 and 4.

Locality.—St. Paul de Loanda; September 23, 1915; 1 ♀.

Range.—Mouth of the Congo, 44 meters (Doflein). St. Paul de Loanda.

Measurements.—Length of carapace to end of median tooth, 27.4; length of carapace to median sinus of front, 26; greatest width measured between tips of the posterior of the lateral teeth, 30 mm.

Description.—Sutures of carapace feeble except the longitudinal portions of the H-form depression in the center of the carapace. Rostral horns stout, conical, the two lateral spines as long as their basal width, and longer than the depressed median spine. A short, thick, triangular spine at upper, inner angle of orbit; a much smaller

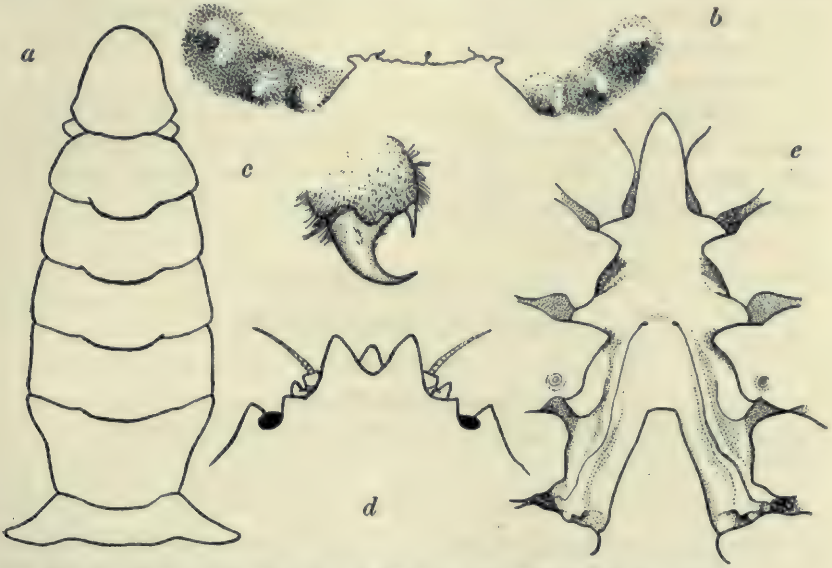


Fig. 1. *Dromia atlantica*, female 30 mm. wide, St. Paul de Loanda.

A, abdomen; *b*, edge of epistome and neighboring tubercles; *c*, extremity of left third leg; *d*, anterior part of carapace with antennæ and eyes; *e*, sternum, showing sulci.

spine at lower, inner angle; just below the outer fissure lies the largest of the orbital spines, conical, pointing forward. Four anterolateral spines; the interspaces of the anterolateral border are of different lengths, represented by 3.1.2.4, the fourth interspace being the longest, the second nearly as long, the first, or that lying next the orbital tooth, still shorter, while the third interspace is a little more than half as long as the fourth. The first anterolateral tooth is one of a row of three protuberances leading to the buccal cavity and diminishing in size, the interspaces subequal. Edge of epistome crenulate, with about ten crenules.

Carpus of cheliped uneven with a few low nodules, and two large, conical ones on the border next to the manus. The pubescence, which coats the entire animal, reaches to the middle of the immovable finger, but farther down the outside of the dactylus, and only a third the length of the upper surface of the same. Carpus of last leg subtriangular, strongly widened toward the distal end. The propodus of the last two legs bears a very slender, short spine at its extremity which forms a sort of chela with the dactylus.

Sternal sulci slender, inconspicuous, reaching only to a line which, if continued, would run between the first and second ambulatory legs. Terminal segment of abdomen (of female) a little longer than wide.

Doflein described this species from a male specimen, from the mouth of the Congo, only 8 mm. long, in which the length of the carapace including the rostrum was as great as the width; in the adult female here described the carapace is a little wider than its total length. In Doflein's figure 3, Plate VII, the rostral horns are narrower and the interspace wider than in the female. In the female there is a difference in color between the outer and inner portions of the pterygostomian regions. Otherwise the two specimens seem to agree.

"This small crab was found at a depth of only a few feet between sponges that surrounded *Pinna*, a description of which is given under *Pisa carinimana*. Its carapace, with its peculiar 'mossy' color and hairiness, completely matched the surroundings." (H. L.)

Subtribe **BRACHYGNATHA**

Superfamily **Brachyrhyncha**

Portunidæ

CALLINECTES Stimpson

Callinectes **Stimpson**, 1860, Ann. Lyc. Nat. Hist. New York, VII, p. 220.

KEY TO THE WEST AFRICAN SPECIES IN THE CONGO COLLECTION

A. Lateral spine of carapace elongate, about three times as long as the tooth just in front of it. Size small, carapace about three inches or less than 80 mm. wide. Appendages of male abdomen reaching to middle of penultimate segment. *gladiator.*

A′. Lateral spine two and one-half, or less than two and one-half, times as long as the tooth just in front of it. Size larger, carapace four or more inches (100 mm. or more) wide.

B. Lateral teeth trending forward, the second to fifth teeth, inclusive, having convex outer margins. Maximum size about four and three-quarters inches, or 120 mm. Appendages of male abdomen very short, overreaching antepenult segment but little if at all. . . . .*marginatus.*

B′. Lateral teeth trending forward little if at all, the margins nearly straight. Maximum size about six inches, or 152 mm. Appendages of male abdomen very long, reaching end, or beyond end, of abdomen. Immovable finger of major chela extraordinarily swollen in its basal half. . . . .*latimanus.*

Callinectes marginatus (A. Milne Edwards)

Plates XIX, Figure 1, XX, Figure 1; Text Figure 2

Neptunus marginatus A. MILNE EDWARDS, 1861, Arch. Mus. Hist. Nat., Paris, X, p. 318, Pl. XXX, fig. 2, Gaboon. Types examined (3 young ♀♀).

Callinectes larvatus ORDWAY, 1863, Boston Journ. Nat. Hist., VII, p. 573, Key West, Tortugas, Bahamas, Haiti. RATHBUN, 1895, Proc. U. S. Nat. Mus., XVIII, p. 358, Pls. XVII; XXIV, fig. 5; XXV, fig. 4; XXVI, fig. 4; XXVII, fig. 4.

Callinectes larvatus A. MILNE EDWARDS, 1879, Crust. Rég. Mex., p. 225 (variety of *C. diacanthus*).

Callinectes africanus A. MILNE EDWARDS, 1879, Crust. Rég. Mex., p. 229 (variety of *C. diacanthus*), Cape Verde Islands. Types examined (2 large ♂♂).

Callinectes larvatus var. *africanus?* BENEDICT, 1893, Proc. U. S. Nat. Mus., XVI, p. 537.

Callinectes marginatus RATHBUN, 1897, Proc. Biol. Soc. Washington, XI, p. 149. DE MAN, 1900, Mém. Soc. Zool. France, p. 41, Pl. I, figs. 5, 5*a* (♀ not ♂). BOUVIER, 1901, Bull. Mus. Hist. Nat., Paris, p. 16.

Localities.—Banana; July 1915; 7 ♂♂, 7 ♀♀, 1 young. One specimen, a ♂, is of large size, the remainder are medium or small. Banana; August 1915; 10 ♂♂, 9 ♀♀, varying from 21.5 to 40.5 mm. in length. Moanda; July 1915; 2 ♂♂, immature. St. Paul de Loanda; September 23, 1915; 1 ♀, young. Locality not given; 1 ♂, half grown.

Range.—West coast of Africa, from Cape Verde Islands to Lobito, Angola. Florida Keys and Bahamas to Bahia, Brazil.

Measurements.—Length of male (Banana, July 1915) to the median sinus of the front, 43.8; width, 101; length of lateral spine, 10.6; length of preceding tooth, 4 mm.

Description.—Areolations of carapace well marked; granules coarse; gastric ridges slightly curved and parallel; length of intramedial area (that part of the gastric region behind the posterior of the gastric ridges) a little less than half of its anterior width and from two-thirds to three-quarters of its posterior width. Front, between the antennæ, four-toothed; median teeth small but well marked; lateral teeth broadly obtuse. Suborbital tooth prominent, arcuate, curved upward. The anterolateral teeth trend forward and are, in the adult, separated by deep rounded sinuses; the second to fifth teeth, inclusive, have convex posterior or outer margins;

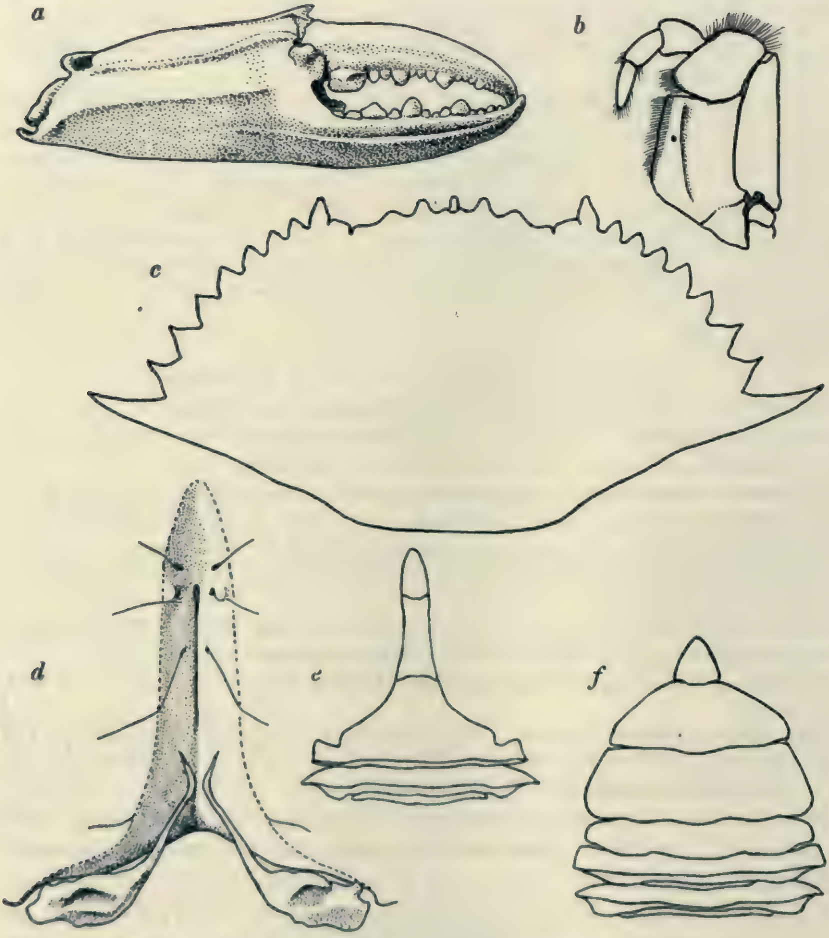


Fig. 2. *Callinectes marginatus*, Banana.

A, right, major chela of male 101 mm. wide; *b*, outer maxilliped of same; *c*, outline of carapace of same; *d*, appendages of first abdominal segment, in sternal cavity, same specimen; *e*, abdomen of same; *f*, abdomen of female 85 mm. wide.

first three or four teeth obtuse or subacute, the remainder acute or sharp; lateral spine between two and two and one-half times the length of the preceding tooth.

Distal end of merus of maxilliped strongly arched. Costæ of manus of cheliped prominent, roughened with granules of medium size. The lowest costa of the outer surface vanishes on the proximal half of the segment. Large tooth at base of dactylus of major chela broader than long.

Male abdomen small; penultimate segment wider at proximal than at distal end, margins slightly concave; appendages very short, overreaching third segment but little or not at all. Terminal segment of female abdomen a little longer than wide.

The crosswise sternal groove just in front of the abdomen is not straight but is directed obliquely backward a little from the outer ends to the median line.

The female is smaller than the male; the carapace is more swollen; the granules coarser, more bead-like. In the medium-sized and young specimens the sinuses between the lateral teeth are relatively smaller and less rounded than in the adult or old, but the teeth always curve forward in the manner characteristic of this species.

Callinectes gladiator Benedict

Plate XIX, Figure 2; Text Figure 3

Lupa smythiana Leach (*nomen nudum*) in White, 1847, List Crust. Brit. Mus., p. 27. Not *Neptunus sanguinolentus* (Herbst).

Callinectes tumidus var. *gladiator* Benedict, 1893, Proc. U. S. Nat. Mus., XVI, p. 537, Beyah River, Elmina, Ashantee.

Callinectes tumidus gladiator Rathbun, 1895 (1896), Proc. U. S. Nat. Mus., XVIII, p. 360.

Callinectes gladiator Rathbun, 1897, Proc. Biol. Soc. Washington, XI, p. 150.

Localities.—Banana; August 1915; 6 young (4 ♂♂, 2 ♀♀). Banana (no date); 2 ♂♂, 1 ♀, all adult. San Antonio; August 1915; 1 ♂ adult, 2 young (♂, ♀).

Range.—Liberia to San Antonio, Angola.

Measurements.—Length of male (San Antonio) to the median sinus of the front, 30.3; width, 78.7; length of lateral spine, 10.8; length of preceding tooth, 3.4 mm.

Description.—A smaller and more delicate looking species than *C. marginatus.*

The carapace is more strongly areolated, the six bosses (four branchial, two cardiac) which surround the posterior part of the gastric region are very prominent; a still higher elevation lies just outside the inner branchial nodules and is finely and closely granulate. The granulation of the carapace as a whole is finer and sparser than in *marginatus;* both raised gastric lines are curved forward at outer ends and are subparallel; one or both, however, may be slightly bent forward at the middle. The intramedial area is more constricted behind than in the preceding species; its length is considerably less than half its anterior width and is from two-thirds to three-quarters its posterior width. The four median teeth are narrower, those of the median pair more prominent, tuberculiform. The anterolateral teeth are separated by narrower sinuses; the lateral spine is very long, about three times as long as preceding tooth.

Distal end of merus of outer maxilliped strongly arched; outer angle more strongly produced sideways.

Fingers of cheliped more slender than in *marginatus;* basal tooth of major dactylus broad, low and of moderate size.

Male abdomen small; the spine at each end of the second segment in both sexes is compressed, slender, and curved upward and sometimes backward. The male abdominal appendages reach quite to the middle of the penultimate segment.

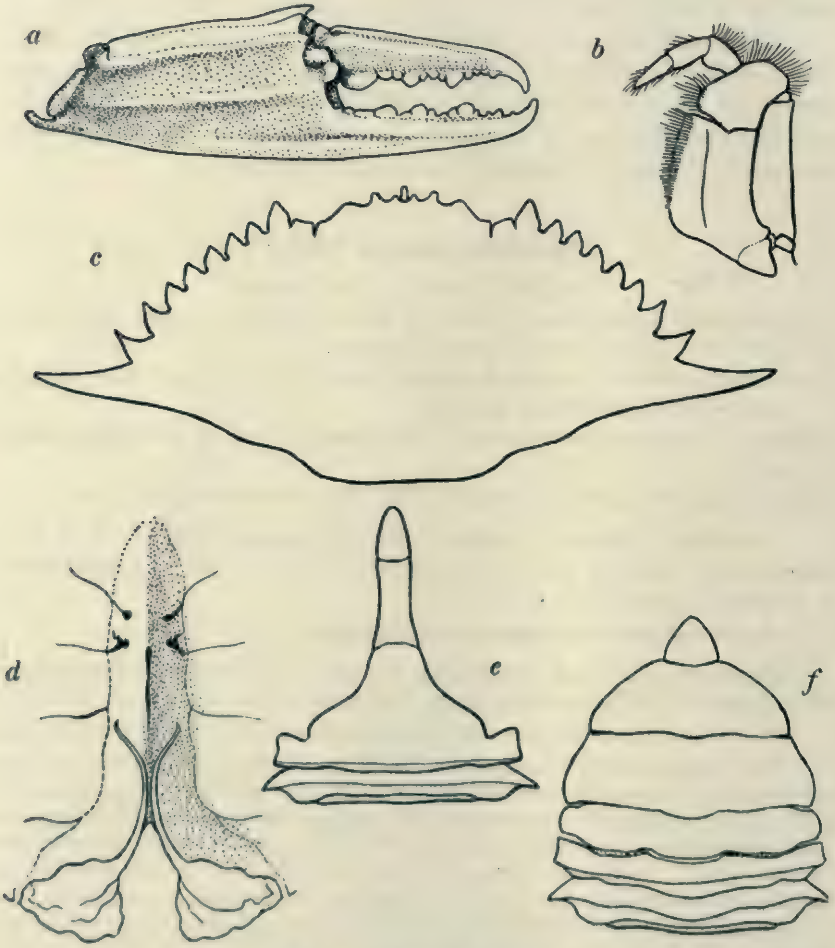


Fig. 3. *Callinectes gladiator.*

A, right, major chela of male 79.8 mm. wide, Banana; *b*, outer maxilliped of male 78.7 mm. wide, San Antonio; *c*, outline of carapace of same ; *d*, appendages of first abdominal segment, in sternal cavity, same specimen; *e*, abdomen of same; *f*, abdomen of female 74 mm. wide, Banana.

Callinectes latimanus Rathbun

Plates XV, Figure 2, XXI, XXII, Figure 1; Text Figure 4

Callinectes bocourti Rathbun (not A. Milne Edwards), 1897, Proc. Biol. Soc. Washington, XI, p. 151, African specimens only.

Callinectes latimanus Rathbun, 1897, Proc. Biol. Soc. Washington, XI, p. 151, text-figs. 6–8, Lagos, Bight of Benin, Guinea.

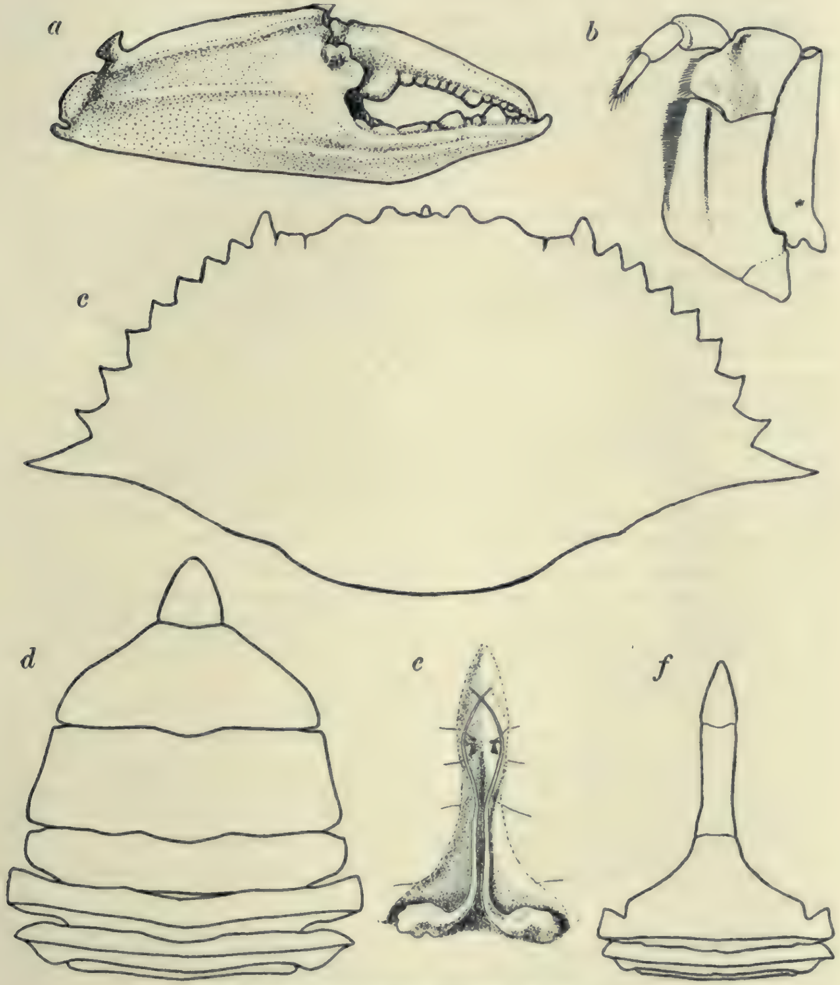


Fig. 4. *Callinectes latimanus*, Banana.

A, right, major chela of male 129.3 mm. wide; *b*, outer maxilliped of same; *c*, outline of carapace of same; *d*, abdomen of female 109.8 mm. wide; *e*, appendages of first abdominal segment, in sternal cavity, of same male as *a*; *f*, abdomen of same.

Neptunus marginatus var. *truncata* Aurivillius, 1898, K. Svenska Vet.-Akad. Handlingar, XXIV, Afd. IV, No. 1, p. 5, Pl. I, figs. 1–4, Cameroon, immature ♀, not ♂.

Callinectes diacanthus var. *africanus* Lenz, 1910, Wiss. Ergeb. d. Deutschen Zentral-Afrika Exped. 1907–1908, Leipzig, III, Zool. I, Lief. 3, p. 5, Landana, two young specimens.

Locality.—Banana; July 1915; 10 ♂♂, 6 ♀♀ of large size, 1 ♂ of medium size, 1 young ♂, 1 young ♀. Banana; August 1915; 2 ♂♂ medium. Banana; September 1915; 1 ♂ medium, 1 very large dried ♂.

Range.—From Senegal to the mouth of the Congo.

Measurements.—Largest male, dried: length of carapace to median sinus of front, 72 mm.; width to tip of lateral spines, 152 mm.; width immediately in front of lateral spines, 127.5 mm.

Description.—Of larger size than *marginatus;* surface near the margins very sparsely granulated. Raised gastric lines curved forward at outer ends, especially the anterior line, so that the distance between these lines is less at the middle than toward the outer ends. Intramedial region longer in proportion to its width than in *marginatus;* its length just equal to its posterior width and half, or nearly half, its anterior width. Raised branchial line straighter than in that species, not directed toward the tooth in front of the lateral spine but, throughout its slightly sinuous course, toward the spine itself. Frontal teeth more triangular than in either of the other species, and the median pair larger and more advanced in proportion to the outer pair. Lateral spine moderate, from 2.25 to 2.5 times the length of next tooth. Lateral teeth more triangular than in the other species, sides nearly straight (in teeth 2 to 6), and edges coarsely granulate; in teeth 2 to 7, inclusive, the anterior or inner margin of each tooth is shorter than the posterior or outer margin.

Distal margin of merus of outer maxilliped subtruncate. Costæ of manus not prominent, granulated lines narrow, almost disappearing on the two lower costæ of the outer surface. In the major chela the basal part of the immovable finger is excessively swollen along the lower margin; the basal tooth of the dactylus is very large, obliquely placed and normally longer than wide.

The male abdomen is much larger in proportion to the sternum than in *marginatus;* the terminal segment is nearly twice as long as broad. The appendages reach beyond the tip of the abdomen itself. The last segment of the female abdomen is very little longer than wide; the lateral margins of the penultimate segment are for the most part nearly straight, then curve gently backward to meet the antepenult segment; this last is a little shorter than the penult segment.

The crosswise sternal groove just in front of the abdomen is transverse or very nearly so.

The female is smaller than the male. Its carapace is more regularly convex than that of the male and the surface less uneven. The surface is more densely and coarsely granulous, although granules are always sparse near the lateral margins, still sparser near the front, and quite absent from the posterior and posterolateral margins in the male, while in the female there are a few fine granules near the posterior angles.

In the female the intramedial region is less constricted than in the male, and its length may be a little less than its posterior width. On the other hand, in some males the length of the intramedial region is a little greater than its posterior width.

The swollen immovable finger of the large cheliped is common to males and females, from the largest down to one 36 mm. long by 71.3 mm. wide. An exception is a male, 45.2 by 92 mm., in which the fingers of the major cheliped are narrow and elongate, almost meeting when closed, and the basal tooth of the dactylus only slightly enlarged. This may be due to injury and consequent regeneration of the chela; the chela resembles that of a young male, 22.5 mm. long by 42 mm. wide. On the other hand, a still smaller specimen, female, 17.4 mm. by 35 mm., has a stout major chela, with gaping fingers; large, characteristic, basal tooth on the dactyl; and the faint beginning of a swelling of the immovable finger. In proportion to its size the lateral spine is longer than in older specimens, and the four teeth preceding the spine are unusually sharp.

I think that I was mistaken in 1897 (*loc. cit.*) in referring African specimens to *C. bocourti*. The young specimen (18735) in the National Museum from Senegal is, I believe, *C. latimanus;* it had been labeled "*C. africanus*" at the Paris Museum, but it is not one of the type lot. The types of *africanus* consist of two large males from the Cape Verde Islands and, although I am unable to re-examine them at present, I still consider them *marginatus*, because A. Milne Edwards's brief description of *africanus* applies better to *marginatus* than to the other African species. From notes made long ago at the Berlin Museum on a large male (5566) from Chinchoxo and a small female (3647) from Liberia, I conclude that these too should be referred to *latimanus*.

"Crabs of the genus *Callinectes* were common on submerged flats in sites where the fine, loose sand was constantly but gently moved by the action of the waves. They were numerous near Banana (Pl. LVI, fig. 1), Moanda, San Antonio, and Padron Point, but the different species were not distinguished in the field. Most of the series of *C. latimanus*, including the largest male, which measured six inches across the carapace from spine to spine, were taken in the bay to the east of and about half-way up Banana peninsula in a sheltered place where the salinity of the water was considerably reduced. Here at low tide these crabs can be observed when hurrying over the sand in shallow water. With one claw fully outstretched and with adjoining limbs pressed alongside, both rudder and limbs unite in sudden efforts by which they shoot like an arrow in short zigzags. With surprising dexterity they shift their rudder-blades and limbs. So rapidly do they move beneath the protecting clouds of fine sand they stir up that it becomes difficult to discover their whereabouts; and so suddenly do they assume immobility that the sand drifting back covers all trace of their new hiding place, usually just below the sandy surface which the waves have helped to smooth. None were seen on land.

"The species included in this genus represent the well-known 'soft-shelled' crabs, yet in the estuary of the Congo neither white men nor natives use them as food. The flatness of the carapace, the slender claws, and the modification of the posterior limbs into flat rudders, easily shifted, make this group first-class swimmers, and the strong spines at the edge of the hard carapace undoubtedly protect them against being swallowed by fishes. Their rapidity in defense, and the quick use of their sharp hands make catching them a lively sport." (H. L.)

THALAMITA Latreille

Thalamita LATREILLE, 1829, in Cuvier, Le Règne Animal, IV, p. 33, footnote.

Thalamita africana Miers

Plate XXIII; Text Figure 5

Thalamita integra var. *africana* MIERS, 1881, Ann. Mag. Nat. Hist., (5) VIII, p. 218, Canaries.

Locality.—St. Paul de Loanda; September 21 and 23, 1915; 9 ♂♂, 10 ♀♀ ovig., 1 ♀ young.

Range.—Canary Islands; Gorée Bay, Senegambia, 9 to 15 fathoms (Miers); St. Thomas Island (Osorio); St. Paul de Loanda.

Measurements.—Length of carapace of male, 26.7; width of same, 42.1; fronto-orbital width, 31 mm.

Description.—This species belongs to the group of *Thalamita* in which the front between the antennæ is bilobed, or between the orbits quadrilobed; in which the two median lobes form a convex arch, and are separated from each other by a slight fissure, the margin of each lobe slightly concave at middle. The overlapping lobes of the outer pair are oblique and considerably narrower than those of the inner pair. Anterolateral margins considerably curved for a *Thalamita;* first tooth widest and subtruncate; second and third teeth similar to each other and blunt-pointed; fourth and fifth teeth acute; fourth much the smallest but not rudimentary; fifth projecting laterally much beyond the others. Three finely crenulated transverse ridges; one between the teeth of the last pair, interrupted at the cervical suture and on the median line; one protogastric, narrowly interrupted by the mesogastric region; and one in front of this, widely separated in the middle. Besides, there is a very short ridge on the branchial region not far from its inner boundary; this is most evident in females and may disappear in old males. Epigastric lobes rather prominent. Remainder of carapace smooth.

Ridge on basal segment of antennæ smooth, nondentate but finely granulate.

Chelipeds of male not very unequal, nearly smooth. Inner margin of merus provided with a distally-directed rounded lobe or tooth, followed by three or four small

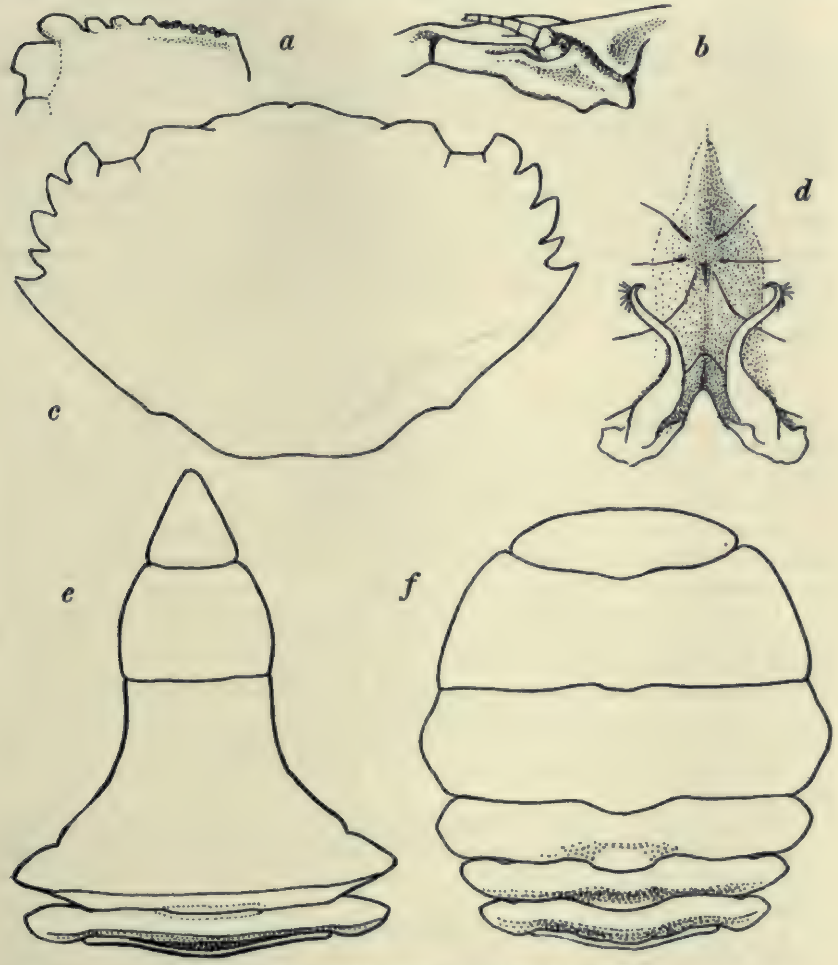


Fig. 5. *Thalamita africana*, St. Paul de Loanda.

A, anterior edge of merus of left cheliped of male 42.1 mm. wide; *b*, right antenna of same, showing basal segment; *c*, outline of carapace of same; *d*, appendages of first abdominal segment, in sternal cavity, of same specimen; *e*, abdomen of same; *f*, abdomen of female 33 mm. wide.

lobes and a number of granules, gradually diminishing to the proximal end. The carpus has a strong, horny-tipped inner spine and a few blunt ridges on the outer and upper surface. The palm bears at most three blunt ridges, one continued from the propodal finger and two superior, each of which is provided with a blunt tooth or spine distal to the middle; one or both of these teeth may be suppressed. In the female only is there a spine at the articulation with the carpus. In the female, also, the lowest ridge of the palm is longer and sharper than in the male. The merus of the swimming-foot is twice as long as wide; the propodus is armed below with a few fine spinules.

The front is more arcuate than in *T. integra*,[1] its lateral lobes arcuate instead of straight; the fourth lateral tooth is small but not minute, as in *integra;* the protogastric regions bear each a short granulated ridge, which is lacking in *integra;* and the two spines on the upper edge of the hand are blunt, not sharp.

"The most common species in the quiet stretches of the bay near the town of St. Paul de Loanda, and easily caught at low tide on the many submerged sand flats. Their behavior is much the same as that of *Callinectes* (p. 401), but their habitat there is typically marine." (H. L.)

Potamonidæ

Carapace broader than long, subquadrilateral, oblate-oval, or almost circular. Anterolateral borders arched, no longer, and often much shorter, than the posterolateral borders, which are convergent. Regions seldom areolated; the cervical suture may be deep and conspicuous or interrupted, often well defined only behind the mesogastric area. Branchial regions much dilated.

Front typically broad, not separated from the inner supraorbital angles, usually obliquely deflexed, sometimes horizontal or vertically deflexed, commonly bilobed or entire, seldom armed with spines or tubercles.

Antennules usually folded transversely in narrow fossæ, antennal peduncles occupying the orbital gap, the distal joints overlapped by the front. Antennal flagella short, sometimes quite vestigial.

Epistome transverse, of fair length fore and aft, well demarcated and never encroached upon by the external maxillipeds. The palpus of the latter articulates at, or near, the inner angle of the merus. Buccal cavity usually square.

Chelipeds in male unequal, often very much so; in female, equal or nearly so. Legs gressorial.

Sternum broad. Abdomen of male occupying all the space between the last pair of legs. The genital ducts of the male open on the coxopodites of the last pair of legs.

Potamoninæ

Mandibular palp composed of two or three distinct segments; terminal segment simple, often thickened at base for the attachment of a bunch of hairs, or occasionally with a small lobe on the ventral side of its base.

Merus of external maxillipeds transverse.

Efferent branchial channels not abnormally produced.

Antennules transverse.

Dactyli of walking-legs strongly spinose.

Abdomen of adult male almost never abruptly contracted distally; its sixth segment is almost always much broader than long, and its seventh segment is almost always broadly triangular.

---

[1] Dana, 1852, Proc. Acad. Nat. Sci. Philadelphia, VI, p. 85; 1852, U. S. Expl. Exped., XIII, Crust., part I, p. 281; 1855, Atlas, Pl. XVII, figs. 6a–d.

POTAMON Savigny

Potamon SAVIGNY, 1816, Mém. Anim. sans Vert., I, p. 107. RATHBUN, 1904, Nouv. Arch. Mus. Hist. Nat., Paris, (4) VI, p. 247 (part).

Carapace traversed by a crest which consists of two portions, namely, (1) a shorter, coarser, epigastric portion, and (2) a longer, sharper, postorbital portion; these two portions may be distinct and discontinuous, or may be continuous, or one or both of them may be indistinct to the verge of disappearance.

Front broader than orbit, about one-fifth to about two-sevenths the greatest breadth of the carapace, deflexed, usually broadly bilobed or sinuous.

Outer orbital angle usually dentiform.

Anterolateral borders of carapace usually well defined, often cristiform and serrulate or crenulate, sometimes cut into large teeth or spines; their curve is usually broken, near the level of the postorbital crest, by a notch and spine, but these may be indistinct or obsolete. Posterolateral borders usually rounded and indefinite, crossed by oblique wrinkles continued from the side walls of the carapace.

Dactyli of legs armed with four rows of spines.

Abdomen of adult male regularly triangular. Abdomen of adult female broad, its terminal joint not elongate. In both sexes all seven abdominal segments are distinct and separate. (Condensed from Alcock.)

Subgenera.—The division of the genus *Potamon* into the three large subgenera *Potamonautes*, *Potamon*, and *Geothelphusa* is an arbitrary one, as it is based on the completeness, continuity, and distinctness of the postfrontal crest; and between any three groups into which the genus may be so divided there are various intergrading forms which it is difficult to place without violating the letter of the definitions. Alcock, in his key,[1] put *Potamonautes* under the headings, "3. Postorbital crests and lateral epibranchial spine very distinct" and "5. The epigastric and postorbital crests of each side form an unbroken line." In "3" I would insert after "lateral epibranchial spine" the words "if present." In my monograph of the Potamonidæ, 1904–1906, there were included in *Potamonautes* a number of species in which the crest was not distinct throughout its length. Today I would restrict that subgenus to those forms having a very distinct, meaning a sharp-edged, crest (it very often overhangs the surface in front of it), which shows no break except on the median line. There may or may not be a spine or tooth on the lateral margin at the end of the crest. I would omit from *Potamonautes* those species which I previously placed there in which the crest is strong but is interrupted by a notch at the outer end of the epigastric lobes.

It is difficult to define the limits of the subgenus *Geothelphusa*. Alcock gives in his key, "3. Postorbital crests and lateral epibranchial spine indistinct or obsolete." In reality, the outer portion or outer half or two-thirds of the postorbital crests may be very distinct (e. g., *congoënsis*, two-thirds grown), although separated from the epigastric crests by an appreciable space where the surface rounds smoothly downward anteriorly. This pattern of geothelphusid crest is but slightly removed from that of *ballayi* and that again from *obesus*, both in the subgenus *Potamon*, while in some similar species also in the subgenus *Potamon* the postorbital crests are much more indistinct although more extensive than in the geothelphusids *congoënsis* or *perparvus*.

---

[1] 1910, Records Indian Mus., V, p. 257.

Acanthothelphusa is here reckoned as a subgenus of *Potamon*, because it is separated from the three subgenera discussed above by only one character, that of having several epibranchial spines or teeth. In other respects the species agree with one or another of the older subgenera.

Subgenus **POTAMONAUTES** MacLeay

Potamonautes MacLeay, 1838, Illus. Zool. S. Africa, Annulosa, p. 64.

Postorbital crest very distinct or sharp-edged, forming an unbroken line with the epigastric crest. The spine or tooth or angle at the outer end of the crest is very distinct. There may be a tooth between the epibranchial tooth and the orbital tooth.

Potamon (Potamonautes) floweri de Man

Plate XX, Figure 2; Text Figure 6

Potamon (Potamonautes) floweri de Man, 1901, Proc. Zool. Soc. London, p. 94, Pl. x. Rathbun, 1904, Nouv. Arch. Mus. Hist. Nat., Paris, (4) VI, Pl. xvii, figs. 2 and 6; 1905, (4) VII, p. 193.

Localities.—Libreville, in the Gaboon; February 1916; J. P. Chapin, collector; A4518; 10 ♂♂, 7 ♀♀. The following localities are all in the Belgian Congo. Yakuluku; November 1911; 1 ♂. Garamba; June 1912; 1 ♀. Faradje: March-June 1911, 17 ♂♂, 5 ♀♀; 1911, No. 250, 1 ♀; October 1912, 3 ♂♂, 1 ♀ young; without date, 5 ♂♂, 7 ♀♀. Vankerckhovenville; April 1912; No. 414; 2 ♂♂, 1 ♀; the larger male has an emargination in the right side of the crest; the smaller male has regenerated the right maxilliped, which is reduced and abnormal. Ngayu; December 16, 1909; 1 ♀ ovig. Affluents of the Nepoko River near Gamangui (Ituri Forest): No. 68; 1 ♂. No. 69; 4 ♂♂, 7 ♀♀ (1 ovig., 1 with newly hatched crabs). No. 72; 4 ♂♂, 2 ♀♀ (1 ovig., 1 with newly hatched crabs). No. 73; 2 ♂♂, 5 ♀♀ (1 ovig.). No. 75; 3 ♂♂, 1 ♀. Poko: August 1913; No. 638, 1 ♀; October to December 1913, 1 ♂, 1 ♀, both small and with thin shell. South of Poko; October to December 1913; 2 ♂♂, 7 ♀♀ (1 ovig., 1 with newly hatched crabs). Affluents of the Tshopo River near Stanleyville; No. 884; 2 ♂♂. Banana; August 1915; 4 ♂♂.

Range.—The type locality is Bahr-el-Gebel, Soudan. The species has been taken also in the Yei River, affluent of the Nile, 1130 meters altitude; Upper Ubangi, French Congo; and at Faradje, "Dougou" River (probably Dungu), 1060 meters altitude.

Measurements.—Length of largest specimen, male (No. 68), 37.4; width, 59.8 mm. Length of smallest, free-living specimen in the collection, a male (Faradje March–June 1911), 13 mm.; width, 19.3 mm.

Diagnosis.—Carapace very convex. Postfrontal crest partly overhanging orbit. Lateral margin with two small teeth behind orbital tooth.

Description.—The carapace is very wide, its length about three-fifths of its width; very convex from front to back, much less so from side to side; surface smooth, finely punctate. Grooves in center of carapace of moderate depth; lateral portions of cervical groove indistinct; mesogastric suture tectiform; furrow behind orbits very deep.

Postfrontal crest transversely sinuous, more advanced behind orbits, edge crenulate in outer half. The crest occupies a much more advanced position than in allied species, and this is accented by the convexity of the carapace, with the result that, when viewed from above, the crest covers more or less of the orbital margin and also the tooth lying between the orbital and epibranchial teeth.

Anterolateral margins strongly arcuate, granulate or denticulate, often obscurely so, when it appears smooth and entire; posterolateral margins concave.

Front, measured below, one-fourth the width of the carapace; from above the edge appears widely emarginate; sides very oblique.

Outer orbital tooth acutangular, sharp. Between this tooth and the epibranchial angle there is a small, granulated tooth or prominence, immediately behind the deep groove which separates the suborbital and subbranchial areas. On the lateral margin, in front of this groove there may be one or two denticles or tubercles.

Lower margin of orbit almost transverse, little arcuate; a deep, outer notch commonly V-shaped.

Mandibular palp composed of two distinct joints, the terminal joint cut into two lobes (the outer one very short), which embrace the incisor process of the mandible.[1] Furrow on ischium of outer maxillipeds slightly nearer inner than outer margin; exopod with a flagellum half as long as its stalk.

Sternum thickened along insertion of chelipeds, and having a transverse groove between posterior outer corners of maxillipeds.

The subterminal projection of the inner face of the arm is a large, rather sharp, tubercle. Outer face of arm and wrist almost smooth. Primary and secondary spines of wrist acute. Fingers long, narrowly gaping, marked with a few rows of punctæ; upper margin of dactylus serrated with tubercles pointing distad. Similar but fewer tubercles on upper surface of palm. The prehensile teeth on the proximal half of the fingers are larger than on the distal half.

Merus of last two pairs of legs three times as long as broad.

Posterior width of terminal segment of male abdomen one-third greater than its length; penult segment the same length as the last, its anterior margin four-fifths

---

[1] The mandible has the terminal segment of the palp more deeply divided than in *Potamon madagascariensis* (See Calman, 1913, Proc. Zool. Soc. London, text-fig. 161*B*, on p. 923) and forms a closer link with the subfamily Gecarcinucinæ.

of its posterior. Appendage of first segment with a long slender tip, directed obliquely outward.

The species is well figured with details on Plate x, de Man, *op. cit.*

The crest varies much in direction: the middle half may be either quite transverse or slope back a little each side of the middle; it then runs obliquely forward to the extremity, in an arcuate or a straight line.

In many specimens of medium size, the anterolateral margin forms a sharper rim than in the old. Likewise the upper surface of the palms and movable fingers is usually rougher than in the old, and there may be an additional row of serrations on the inner surface just below the upper margin of the dactylus. These characters are by no means constant. Individuals of both sorts and of similar size may be found in the same lot. The palm and fingers are shorter and wider in medium than in the largest specimens.

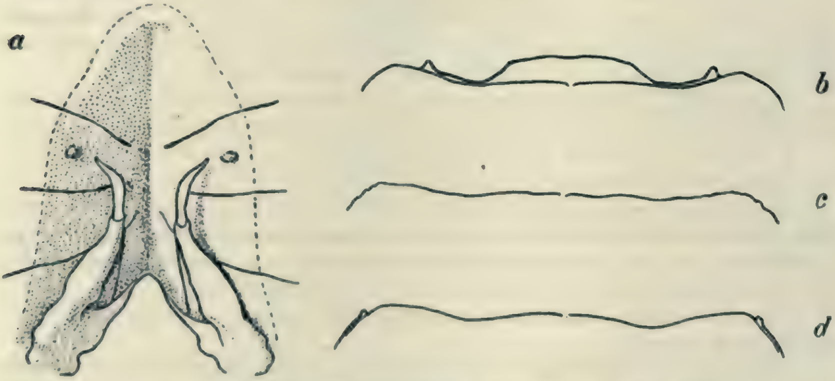


Fig. 6. *Potamon* (*Potamonautes*) *floweri*, male, Faradje.

A, appendages of first abdominal segment, in sternal cavity, of specimen 55.6 mm. wide; *b*, crest and anterior outline of a carapace 51.5 mm. wide; *c*, crest of a carapace 53.4 mm. wide; *d*, crest of same specimen as *a*.

The newly hatched young measure from 4.4 mm. long, 5 mm. wide (No. 69), to 4.8 mm. long, 5.3 mm. wide (S. of Poko). The front of the carapace is much less deflexed than it becomes later; sides of front subparallel, outer orbital tooth minute, epibranchial tooth still more so.

The eggs vary in diameter from 3 mm. (No. 69) to 3.5 mm. (No. 73).

P. (*Potamonautes*) *aubryi* Milne Edwards has the terminal segment of the mandibular palp bilobed as in *P. floweri;* the two species resemble each other in their very convex, subcylindrical form.

"The habits of this common and widely distributed species are so different from those of all other river crabs that in the field we soon called specimens of *Potamon* (*Potamonautes*) *floweri* 'land crabs.' To be sure they occurred in nearly all the shallow brooks (Pls. LXIII and LXIV), but in the parts of the Rain Forest we visited they were equally at home on land, at least in all humid places, whether high on a hill, or beneath overhanging banks of brooks. Heaps of dead vegetation in the water-courses are among their favorite haunts and may also help their wide distribution when forced down-stream by the floods.

"The puffed, smooth appearance of the short, deep, unarmed carapace is associated with the air-breathing habit, and contrasts with the more flattened, well-modeled, rough, and even spiny carapace of crabs typical of the rivers of the interior. The color of this species is peculiarly protective in the various habitats, and to such an extent that on land the crabs often could be discovered only when rustling among dead leaves. Most of the upper surface is dark purplish brown, tones of yellow predominate on the big shears and legs, and the lower side is purplish gray; a yellowish line on the orbital border is more or less accentuated in different individuals.

"Our failure at first to see any of these crabs when we marched northward across the plains of the Uele District led us to believe that they were entirely absent, even from the rivers of the Savannah region. To our surprise we later found that during the dry season these 'land crabs' were all estivating in burrows. As the rainy season sets in they scatter again and may be found in brooks, swamps, and on land.

"At Faradje one of them had dug its burrow in the neighborhood of the Dungu River near the edge of a swamp we passed every day. Four times in two months it pushed new, damp soil outward, though it always kept the entrance clogged up. Finally, its successive efforts had raised a rough mound, in form resembling a reversed funnel. On opening the entrance, a thin rod could be lowered nearly five feet into the practically perpendicular channel. The crab always responded to this unwelcome disturbance by pinching the stick with its big claws. As the dry season advanced, the level of the ground-water fell lower and lower, and our crab found it necessary to keep within immediate neighborhood of moisture, or rather near the water-level where it then rested. The continued burrowing to a greater depth is evidently for the purpose of reaching the ground-water. This was especially true in one of the largest colonies met with. As a result of the first showers that introduce the rainy season, at the beginning of March the Yakuluku River had inundated its banks for about two days. In a sheltered cove about two feet above the usual water-level the black mud still showed a smooth, miry condition. On its surface numerous small heaps of excavated mud were very conspicuous and all proved to be from burrows of these crabs. In a stretch of thirty yards two hundred were scattered. Each of the several dozen burrows examined contained but one crab. The floods had obliterated most of the former excavations, though those not reached by the current still showed the previous diggings of these crabs.

"The eggs are relatively large (about 3 mm.) and, as usual, are retained by modified pleopods beneath the recurved abdomen, which is forced far from its usual position by their great numbers. This is especially true after the hatching of the young, which are carried about for some time.

"The chief enemy of these and other river crabs is not man, for natives in the interior of the country do not use them as food.[1] They are extensively preyed upon by young crocodiles, monitors (*Varanus niloticus* Linnæus), insectivorous otters (*Potamogale velox* Du Chaillu), and several small carnivores, chiefly belonging to the mongooses. Large waterbirds are relatively scarce in the West African Rain Forest and none were found to feed on crabs. In a hornbill's (*Ceratogymna*) nest, however, were seen pieces of carapace, evidently brought there by the nursing male bird.

"Their known distribution and the general physiographic conditions of the country inhabited by these crabs indicate that probably they occur all across the equatorial zone from the Nile (Bahr-el-Djebel) to the Atlantic, though on the coast they have been collected only at Libreville (Gaboon) and Banana (mouth of the Congo) and none have been recorded in the regions between the eastern and western localities given by Miss Rathbun." (H. L.)

Potamon (Potamonautes) dybowskii Rathbun

Plate XXIV; Text Figure 7

Potamon (Potamonautes) dybowskii RATHBUN, 1904, Nouv. Arch. Mus. Hist. Nat., Paris, (4) VI, Pl. xv [vii of Potamonidæ], fig. 3; 1905, (4) VII, p. 177, text-fig. 44.

Localities.—This species was described from a single specimen, a male, from Bangui in the French Congo, on the border of the Belgian Congo. Balss records it from Koloka (between Uele and Ituri).

In the Lang-Chapin collection there is a fine series of ninety-one specimens from eleven localities. They are as follows. Libreville, Gaboon, French Congo; February 1916; J. P. Chapin; 3 ♂♂, 5 ♀♀. South of Poko; October to December 1913; J. P. Chapin; 10 ♂♂, 5

---

[1] The crabs brought back from Libreville, by Mr. J. P. Chapin, were all bought in the market.

♀♀. Bafwabaka; December 31, 1909; 1 ♂, 6 ♀♀ (1 young), variety; "above dark brownish mottled with pale greenish-yellow." Affluents of Nepoko River, near Gamangui (Ituri Forest); Nos. 68, 70, 71, 80; 6 ♂♂, 7 ♀♀. Ngayu; December 13, 1909; 1 ♂, 2 ♀♀; "brownish above." Avakubi: October 11, 1909, 3 ♀♀; from the Aruwimi River, October 14, 1909, 1 ♂, 1 ♀; October 21, 1909, 1 ♀; September 1913, 2 ♀♀. Bafwasende; common in the Lindi; September 23 and 25, 1909; 2 ♂♂, 3 ♀♀. Bafwamoko; September 14, 1909; 1 ♂, found in same brook as *P. stanleyensis*. Batama: July 18, 1909, 2 ♂♂, 1 ♀; September 16, 1909, 1 ♂ immature; September 17, 1909, 1 ♀ immature. Affluents of the Tshopo River, near Stanleyville; No. 884, 3 ♂♂, 3 ♀♀. Stanleyville: August 21, 1909, 1 ♀; April 1915, Nos. 833, 843, 859, and 932, 3 ♂♂, 1 ♀ ovig., 2 young; from affluent of Tshopo, April 1915, No. 841, 12 young. Locality not given; 1 ♀ with newly hatched young.

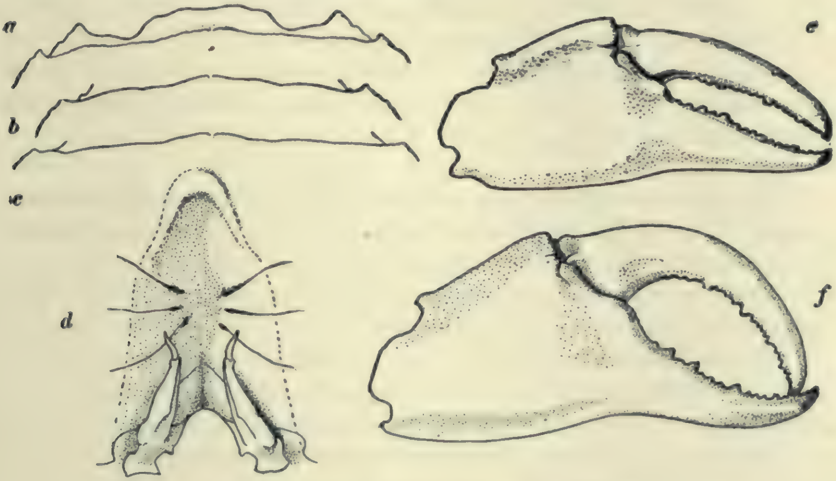


Fig. 7. *Potamon (Potamonautes) dybowskii.*

A, crest and anterior outline of female 64 mm. wide, Nepoko River; *b*, crest of female 52.8 mm. wide, Bafwabaka; *c*, crest of female 70 mm. wide, Bafwasende; *d*, appendages of first abdominal segment, in sternal cavity, of male 62.7 mm. wide, Nepoko River; *e*, right, major chela of same female as *c*; *f*, right major chela of same male as *d*.

Measurements.—Length of carapace of male (S. of Poko), 47.3 mm.; width of same, 63.4 mm.

Description.—The chief characters of the full-grown, adult male are as follows. The carapace is crossed by deep sutures, especially around the hinder border of the mesogastric region; the branchial region is distinctly divided into two subequal parts; the cervical suture disappears just before it reaches the postfrontal crest;

the anterior end of the mesogastric region is roof-shaped; the crest is deeply divided on the median line and slopes backward therefrom to a small, forward-pointing tooth at either end; behind the crest the lateral margin is subentire, obscurely denticulated; orbital angle subrectangular; margin behind it interrupted by the cervical suture and discontinuous with the margin behind the crest, which is on a much higher level than the orbital tooth; a deep notch under orbital angle; front bilobed, outer corners obtusangular.

Mandibular palp two-segmented; a faint suture shows indication of an additional segment at the proximal end; terminal segment simple. Ischial furrow of outer maxillipeds faint; antero-external margin of merus arcuate.

Chelipeds very unequal; one carpal spine, followed behind by several denticles; larger palm widening distally, convex below, palmar finger much deflexed, fingers widely gaping, teeth small, unequal, not crowded; fingers of smaller chela very long, horizontal, narrowly gaping.

The larger chela of the adult female is similar to that figured for the medium-sized male in text-figure 44, cited above, except that the fingers are longer. Eggs about 1.7 mm. in diameter.

Occasionally in adults the tooth at the end of the postfrontal crest, either on one side or both, is lacking or is only indicated; this is the case in a large female from Bafwasende, September 25, 1909.

In most specimens 55 mm. in width and under, the tooth of the crest is altogether lacking. On the other hand, a few carapaces even as small as 13 mm. wide possess one or both small teeth. (See figure 3 of the type cited.)

The exorbital tooth varies in width. In a female from Stanleyville, August 21, 1909, the tooth is narrower than common, the outer margin being definitely though not deeply concave.

In some instances the cervical suture is traceable, though faintly, quite to the inner base of the lateral tooth.

In a set of one male and six females from Bafwabaka, December 31, 1909, the crest has a tendency to be more sinuous and rougher than usual; the terminal tooth is broader and sharper; and the edge behind it is more distinctly serrate. The anterolateral striations of the upper surface are more pronounced. This form I have designated as a variety.

In a lot of three males and five females from Nepoko River, one female has a well-marked V-shaped indentation near the outer end of the crest. This might be thought accidental, if it were not duplicated on the opposite end of the crest.

"In all the small watercourses (Pls. LXIII and LXIV) that meander between the low hills of the Rain Forest *Potamon* (*Potamonautes*) *dybowskii* is fairly common and this should be no surprise since in a single day's march thirty or more of these heavily shaded brooks may be crossed. Wherever the crystal-clear water bubbles and gurgles over a rock-strewn bed one may expect to find this large and lively crab between and beneath the algæ-covered stones, though its discovery is rendered difficult by its protective coloration. The dark brown upper surface of the carapace is mottled with pale greenish yellow, which is still more abundant on the legs. Often the crabs appear to be a dirty, yellowish gray. The tips of the shears are purplish; the abdomen and adjoining parts are usually a dirty, yellowish white, sometimes with a few purple markings on the former.

"It is probably to be found in suitable sites in all the watercourses of the West African Rain Forest. Some of these crabs were infested with hydroid-like parasites." (H. L.)

Potamon (Potamonautes) lirrangensis Rathbun

Plates XXV, XXVI, Figure 3; Text Figure 8

Potamon (Potamonautes) lirrangensis Rathbun, 1904, Nouv. Arch. Mus. Hist. Nat., Paris, (4) VI, Pl. xiv [vi of Potamonidæ], fig. 8; 1905, (4) VII, p. 169.

Localities.—The different lots of *P. lirrangensis* taken at Stanleyville are as follows. August 14, 1909; 1 ♀; "above dark greenish blue, joints of big shears vermilion." August 14, 1909; 1 ♂; caught at the edge of the Congo River. 1 ♀ young; "above greenish blue." August 18, 1909; 1 ♂; "dark brownish blue, abdomen yellowish white." August 28, 1909; 4 ♀ ♀; "dark bluish brown above." August 1909; 1 ♀. September 3, 1909; 1 ♂. February 1915; 2 ♂♂, 12 ♀ ♀ (2 ovig.). April 1915; Nos. 832, 833, 834, 836, 839; 4 ♂♂, 19 ♀ ♀ (6 ovig.). April 1915; Nos. 835, 838, 840; 3 ♂♂, 14 ♀ ♀ (3 ovig.); from the Congo River. April 1915; No. 837; 1 ♂, 2 ♀ ♀ (1 ovig.); the male was regenerating the smaller cheliped.

Range.—This species was described from a single adult female of moderate size, taken at Liranga, French Congo, at the confluence of the Ubangi with the Congo. We have at hand from the present collection sixty-seven individuals, all from Stanleyville and vicinity, which is situated twice as far as Liranga from the mouth of the Congo, and near its union with the Tshopo River.

Balss[1] reports the species from Kituri, upper Lualaba (headwater of the Congo), Katanga region, which is in the southernmost part of the Belgian Congo.

Measurements.—Male (February 1915): length of carapace, 44.7; width of same, 62.6 mm. Female (No. 836): length of carapace, 45.6; width of same, 61 mm. The smallest specimen taken (August 18, 1909) is a male, 22.9 mm. long, 30 mm. wide. The eggs vary in diameter from 1.8 to 2 mm.

---

[1] 1914, Zool. Jahrb., Syst., XXXVII, Heft 4, p. 404.

Description.—*P. lirrangensis* is of the same general type as *P. dybowskii:* the sutures in the center of the carapace are deep; the anterior portion of the mesogastric region is distinctly outlined; and the median groove crossing the postfrontal crest is equally as deep as in *dybowskii*. However, the cervical groove is ill defined after leaving the mesogastric region; the groove dividing the branchial region in two is not accented; the narrow part of the mesogastric region tapers to a point; the postfrontal crest is more transverse than in the foregoing species, its edge is more sinuous and outwardly more crenulate and does not form a tooth at the outer end. Behind the crest the lateral margin is rough with numerous sharply marked acorn-shaped denticulations which point forward and are consequently oblique to the margin. Outer orbital angle narrow, acutangular, outer margin denticulate; orbital margin subparallel to crest; a deep U-shaped notch under orbital angle; margin of frontal lobes rather regularly arched.

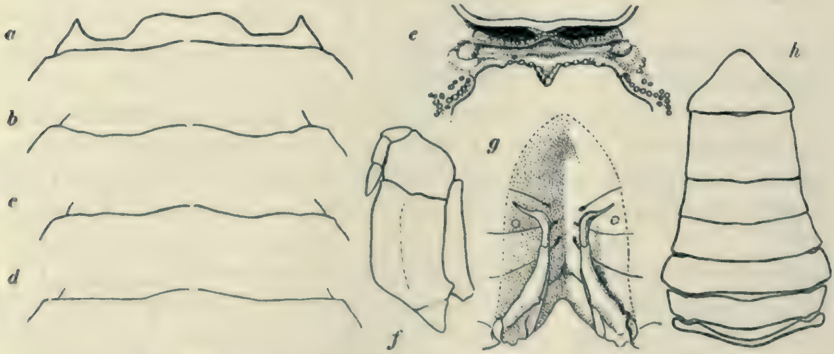


Fig. 8. *Potamon* (*Potamonautes*) *lirrangensis*, Stanleyville.

A, crest and anterior margin of carapace of female 56.6 mm. wide; *b*, crest of female 58.6 mm. wide; *c*, crest of female 54.3 mm. wide; *d*, crest of female 61 mm. wide (crests shown without crenulations); *e*, epistome of male 58.2 mm. wide; *f*, outer maxilliped of same; *g*, appendages of first abdominal segment, in sternal cavity, of same male; *h*, abdomen of same.

The median teeth of the anterior and the posterior margins of the epistome are triangular and longer in an axial direction than the corresponding teeth in *dybowskii*.

Mandibular palp two-jointed; terminal joint simple. Ischial furrow of outer maxillipeds easily visible though not deep; merus longer and narrower than in *dybowskii*, its antero-external margin less oblique.

Chelipeds of adult male very unequal; the sharp and more or less denticulated spine of the merus on the inner surface is just below the middle of the inner margin. Two sharp, good-sized spines on the inner margin of the carpus, the posterior spine smaller than the anterior. The palms increase but little in height distally; the fingers are longer than the middle of the palm in both chelæ, slightly deflexed, little gaping, gradually tapering, armed with irregular teeth, in general alternating large and small, the largest teeth of the immovable finger more distally placed than those of the dactylus; the fingers are dark colored, the color persisting in alcohol, the darkest shade being next the horny tips and followed usually by a lighter band than the main brown shade of the fingers.

The ambulatory legs are more slender than in *P. dybowskii;* the male abdomen is wider, its terminal segment is less narrowed in the distal half, the outer margins therefore less concave.

The larger chela of the female is much stouter and shorter than that of the male; this is an anomaly, as, in this family as well as in most other crabs, the major as well as the minor cheliped of the female is slenderer and feebler than the corresponding member of the male. The excessive development of the major claw in the female *lirrangensis* may indicate the need for a defensive weapon in an inhabitant of the main body of the Congo.

In some specimens, No. 833, the postfrontal crest curves well forward at the outer end, so that in the largest female, it reaches as far forward in that place as at the middle. In other individuals, the crest bends backward near the outer end, as in a female, No. 832. In still others, the crest is very sinuous, as in a female taken August 28, 1909.

"The favorite haunts of *Potamon* (*Potamonautes*) *lirrangensis* are in large rivers near their banks or wherever drifting logs and similar material is caught; also in shallow water where canoes are habitually fastened and where the natives dump their refuse. At Stanleyville they were common in such sites both above and below the falls. In the Tshopo River, at low water, they were fairly numerous among the rocks and boulder fields above the falls, but apparently were absent from the shallow water on the sandy flats below.

"The deep blue shade on the upper surface is especially bright in newly hardened carapaces, but later turns to a distinctly brown or even greenish tint. The lower side is pinkish blue with gray and the joints on the inner side of the big shears are vermilion." (H. L.)

Potamon (**Potamonautes**) **stanleyensis,** new species

Plate XXVI, Figures 1 and 2; Text Figure 9

Type locality.—Stanleyville, from the small affluents of the Tshopo River; April 1915; No. 841; 11 ♂♂, 15 ♀♀, 91 young.

Holotype.—Male (Amer. Mus. Nat. Hist.).

Locality.—Upwards of 250 specimens of all ages were taken at Stanleyville as follows. August 21, 1909; 5 young; "carapace above, dark water-green; towards abdomen more grayish; limbs greenish gray above; abdomen whitish gray." April 1915; No. 833; 4 ♂♂, 2 ♀♀; from brooks. April 1915; No. 841; 11 ♂♂, 15 ♀♀, 91 young; from the small affluents of the Tshopo River. April 1915; No. 843; 1 ♀ with newly hatched crabs, 10 young. April 1915; Nos. 844, 847, 859, 890, 925, 928, 944; 4 ♂♂, 1 ♀, 51 young. April 1915; Nos. 845, 846; 1

♂, 6 young; from forest brook. April 1915; No. 932; 9 ♂♂, 5 ♀♀, 45 young; one very small specimen has a break in the postfrontal crest. May 1915; No. 945; 1 ♂ young. Bafwamoko; September 14, 1909; 1 ♀; found in the same brook as *P. dybowskii*.

Measurements.—Male holotype: length of carapace, 25.2; width of same, 34.7 mm. Largest male, No. 845: length of carapace, 28; width, 39.4 mm. Female, No. 841: length of carapace, 30; width, 40 mm.

Diagnosis.—Front not more than one-third as wide as carapace. Carapace cordiform, rather flat, little granulate below. A shallow, outer, suborbital sinus. Merus of outer maxillipeds nearly as long as broad.

Description.—A rather small species. The carapace is moderately convex from front to back and from side to side; the areoles of the middle are well marked; mesogastric region distinctly delimited; cervical suture stopping a little behind postfrontal crest. Crest most advanced at middle, where it is divided by a deep groove; slightly oblique on either side and nearly straight up to a small, shallow sinus, just within the outer angle which is devoid of a tooth; the edge is smooth to the naked eye, but very finely crenulate. The lateral margin behind the crest is also smooth to the naked eye, but the lens shows minute, distant denticles. The lateral margin in front of the crest is sinuous and discontinuous with the margin behind the crest.

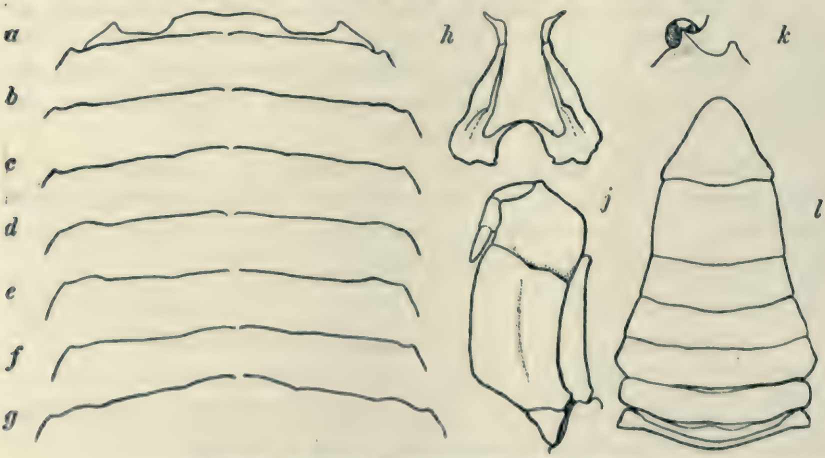


Fig. 9. *Potamon* (*Potamonautes*) *stanleyensis*.

A, crest and anterior margin of carapace of female 30.6 mm. wide, Bafwamoko; *b*, crest of carapace of male 31 mm. wide; *c*, crest of female about 36 mm. wide; *d*, crest of female 38 mm. wide; *e*, crest of female 39 mm. wide; *f*, crest of male holotype 34.7 mm. wide; *g*, crest of male 24.2 mm. wide; *h*, appendages of first abdominal segment of holotype; *j*, outer maxilliped of same; *k*, lateral and slightly ventral view of left orbit showing sinus below outer angle of same female as *c*; *l*, abdomen of holotype.

The edge of the front is bilobed, the lobes arcuate and forming an angle with the side margins of the front. The distance between the angles on the two sides is less than one-third the width of the carapace, while the posterior width of the front is just one-third the width of the carapace. The upper margin of the orbit slopes forward and outward and is sinuous. The outer orbital tooth is much less produced than the front; the notch below it is broad, and shallow; lower margin entire.

The mandible is two-jointed, the terminal joint simple. The groove on the ischium of the outer maxillipeds is deep and near the middle but not parallel to either margin; it stops short of either end of the segment; the merus is nearly as long as it is broad, the angle at which the anterior and the convex outer margins meet being itself rounded off.

The chelipeds of the adult male are unequal. The tooth on the inner surface of the merus, near the distal upper corner, is pyramidal, denticulated, and bluntly pointed. There are two conical, sharp spines on the inner margin of the carpus; the secondary one is much smaller and is followed by a few denticles. The larger palm is much swollen, its lower margin very convex; the smaller palm has similar features but less pronounced. Fingers long, deflexed, tips crossing, prehensile edges slightly gaping, their teeth irregular; in general, a few larger teeth alternate with two or three smaller ones, except at the proximal end where three or four teeth increase in size from the palmar end of the finger; the largest tooth is on the immovable finger.

Ambulatory legs of moderate length, rather slender; the merus of the second leg is three and two-fifths times as long as wide.

The sixth segment of the male abdomen is nearly as long as the seventh. The latter is subtriangular, broader than long, the margins only slightly sinuous and the tip rounded. The appendages of the first segment are strongly bent outward at the tip in the shape of a goose head.

This species is near *P.* (*Potamonautes*) *perlatus*,[1] but is flatter and more cordiform. It is also a much smaller species. The front is narrower; there is a sinus, though a shallow one, in the orbital margin below the outer angle; the lower surface of the carapace is smoother, having no bead granules on the suborbital and subbranchial regions; the merus of the outer maxillipeds is squarer, its length approaching its width; the ambulatory legs are narrower.

It is akin also to *P.* (*Potamonautes*) *anchietæ*[2] from Portuguese West Africa, but differs from it (according to Capello's figure) in its smaller size, narrower front, more oblique and more uneven crest, and in not having a distinctly denticulated anterolateral margin.

In some cases there is a slight prominence in the postfrontal crest just before it reaches the outer sinus. Sometimes there is an arching forward in place of the sinus, or sometimes the existence of the sinus produces a little tooth at the outer angle at the junction of the crest and the lateral margin. On the other hand the crest may be almost straight.

The females run larger than the males. The fingers are less deflexed and usually more nearly meet.

The young in the mother's apron (No. 843) are very narrow, the carapace of one measuring 3 mm. long by 3 mm. wide. The front is longer than in larger specimens and is very slightly bent down. The carapace is strongly areolated and the crest relatively feeble and sinuous, divided into three scallops each side of the middle. Chelipeds equal and similar; ambulatory legs very slender.

---

[1] 1905, Nouv. Arch. Mus. Hist. Nat., Paris, (4) VII, p. 163, Pl. XIV [VI of Potamonidæ], fig. 4.
[2] Brito Capello, 1870, Jorn. Sci. Lisboa, III, p. 132, Pl. II, fig. 11.

In the smallest free-living specimen obtained (No. 928) the same characters exist but the carapace has already widened, being 4.3 mm. long by 4.7 wide. Three larger specimens (No. 928) are, respectively, 8 by 9.5 mm., 9 by 11.2 mm., and 12.4 by 15.2 mm.

The young, up to about 25 mm. wide, are covered with a very short, coarse, but not dense, pubescence. The epigastric portion of the post-frontal crest has often a tendency to separation from the protogastric portion, either by an emargination or by a broader depression of the crest itself. The crest is often more oblique than in the adult and shows more variation in individuals; it is also rougher or slightly more crenulate than in the adult. The lateral margins are minutely roughened or denticulate; those microscopic denticles which at older stages are imbedded in the smooth margin are, in the young, projecting, and visible with a low-power lens or even with the naked eye.

At about 25 mm. wide the crab changes color, from a very dark brownish green (in alcohol) to a much lighter, yellowish green (in alcohol).

"This medium-sized species is fairly common in the more shallow forest brooks (Pl. LXIV), a habitat which also attracts *P.* (*Potamonautes*) *dybowskii* and other forms. It, however, prefers places along the edge of the current, where dead branches and leaves, as well as overhanging green vegetation, create a semi-nocturnal environment even during hours of bright sunshine. At low water such sites are shared only with shrimps, smaller fishes, and a few water-snakes, while the larger forms of this fluviatile fauna retreat into the deeper holes and washouts.

"The general tone of the carapace above is dark green, that of the abdomen gray, and the big shears and limbs greenish gray on the upper side. This crab is not very active when adult, perhaps trusting to its protective coloration and immobility, but the much paler young scamper into hiding readily and prefer the more stagnant and even miry places." (H. L.)

Subgenus **Potamon**

Epigastric and postorbital crests not continuous; the former may be more or less in advance of the latter, or they may be in the same line and well developed, even having a sharp edge, but separated by a notch.

Lateral epibranchial spine distinct.

Potamon (Potamon) ballayi (A. Milne Edwards)

Plates XXVII, XXVIII, Figure 1; Text Figure 10

Thelphusa ballayi A. Milne Edwards, 1886, Bull. Soc. Philom. Paris., (7) X, p. 149; 1887, Ann. Sci. Nat., (7) IV, Zool., p. 132, figs. 2 and 2*a*.

Potamon ballayi de Man, 1898, Ann. Mus. Civ. Stor. Nat. Genova, (2) XIX, p. 436 [55].

Potamon (*Potamonautes*) *ballayi* Rathbun, 1900, Proc. U. S. Nat. Mus., XXII, p. 284.

Potamon (*Potamon*) *ballayi* Rathbun, 1904, Nouv. Arch. Mus. Hist. Nat., Paris, (4) VI, p. 294, text-fig. 27, Pl. xii [iv of Potamonidæ], fig. 9.

Locality.—All the specimens from this expedition were taken in the neighborhood of Stanleyville as follows. August 28, 1909; 1 ♂, "dark brown above with a tinge of red, lighter near edge of carapace." April 1915: No. 833, 1 ♂, 1 ♀, "common in brooks"; No. 840, 10 ♂♂, 21 ♀♀; No. 841, 44 ♂♂ (1 with abnormal claw), 55 ♀♀ (2 with newly hatched young), from affluent of Tshopo River; No. 843, 10 ♂♂, 14 ♀♀ (1 with newly hatched young); No. 844, 1 ♂, 6 ♀♀, from forest brooks; No. 846, 5 ♂♂, 3 ♀♀, from forest brook; No. 932, 31 ♂♂, 29 ♀♀, 6 young; No. 934, 3 ♂♂, 7 ♀♀; No. 944, 4 ♂♂, 8 ♀♀, 2 young; No. 945, 4 ♂♂, 2 ♀♀; No. 946, 4 ♂♂, 6 ♀♀. Bottle 79, 4♂♂, 8 ♀♀ (1 ovig.), 1 young.

Range.—Previously taken in the French Congo at Ngancin[1] (type locality) and Gaboon.

Measurements.—Largest male (No. 846): length of carapace, 19.8; width 30 mm. Largest female (No. 932): length of carapace, 21.1; width 30 mm. Diameter of eggs (No. 841), 1.5 to 1.7 mm.

Diagnosis.—Carapace smooth, suboval. An epibranchial spine present. Postfrontal crest broadly, but not sharply, interrupted behind the outer angles of the front. No furrow on ischium of outer maxillipeds.

Description.—A small species. Carapace suboval, smooth, punctate; H-shaped depression in middle of carapace deep; cervical suture deep in the middle of its length; it stops anteriorly before reaching the postfrontal crest and posteriorly before reaching the inner branchial lobe. The anterolateral margin is an arcuate, granulate line interrupted by a small, sharp, forward-pointing spine at the postfrontal crest and by a very slight sinus in front of the spine; postlateral margin concave. The crest is in general oblique, its outer half margined and advanced at an angle directly behind the external tooth of the orbit; its inner half divided into an epigastric portion which is blunt and well marked, followed by a section in which the crest is almost obsolete; the median furrow is broad and deep and is continued backward for a little distance, forming the acuminate point of the mesogastric region. The front, measured at its lower angles, is one-third the width of the carapace, bilobed, its sides oblique. Upper margin of orbit oblique and sinuous, outer angle short, broad, and obtuse-angled, the orbit having a strong dorsal inclination; a very shallow outer emargination.

---

[1] The original description of *P. ballayi* states that this species "habite le ruisseau du poste Ngancin (Mission de Brazza, avril 1884)". In April 1884, Dr. Ballay, one of de Brazza's companions, was at Nganchu, a poste on the right bank of the River Congo, opposite Kwamouth, according to the account of 'French Explorations in the Ogowe-Congo Region' published in 1886, Proc. Roy. Geogr. Soc. London, N. S., VIII, pp. 770–778. Ngancin is therefore to all appearances a misspelling for Nganchu. This locality is spelled Nganchouno on the map of the French Congo published in 1884, Petermanns Mittheilungen, XXX, Pl. xii. On more recent maps it is often given as Ganschu. (H. L.).

Mandibular palp three-jointed, last joint simple; exognath of outer maxilliped long and plumose. No furrow on ischium of endognath; outer margin of merus arcuate, forming a slight angle with anterior margin.

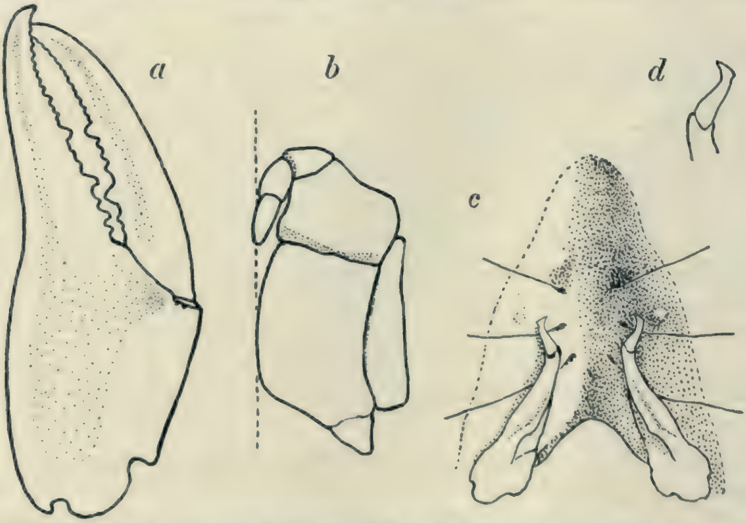


Fig. 10. *Potamon* (*Potamon*) *ballayi*, male, Stanleyville.

A, left, major chela of specimen 26.6 mm. wide; *b*, outer maxilliped of specimen 26 mm. wide; *c*, appendages of first abdominal segment, in sternal cavity, of same specimen; *d*, tip of one of these appendages, more enlarged.

Chelipeds very unequal; spine at distal, anterior corner of lower surface low, conical, granulated. Primary spine of carpus conical, acuminate; secondary spine very small, conical. Larger palm of male swollen; fingers elongate, deflexed; dactylus longer than middle length of palm; gape wide in old males; one, two, or three larger teeth on the basal half of each finger. Smaller chela of male much feebler than larger one; margins of palm subparallel; fingers almost horizontal, dactylus just as long as middle length of palm; fingers not gaping; teeth minute. The two chelipeds of the female are nearly of a size, but the major one shows a slightly swollen palm, and uneven prehensile teeth, with the gape scarcely more than in the minor chela.

Ambulatory legs of moderate size; a few spines towards the distal end of the dactyls are noticeably larger than the remainder.

The male abdomen is broad at base, subtriangular, the sixth and seventh segments having partially concave sides; the sixth segment is about half as long as its proximal width and about two-thirds as long as its distal width; seventh slightly longer than sixth segment.

The carapace of the newly hatched young (No. 843) is 3.2 mm. long by 3.5 mm. wide; the grooves of the carapace are deeper than in older specimens; the front, between the eyes, is squarer and less deflexed and shows three deep longitudinal furrows, the median furrow and one on either side leading back from the lateral angle; the postorbital portion of the crest is not well marked, the outer angle of the orbit is not at all produced, and the epibranchial spine is very feeble.

The smallest specimen collected (No. 932), except those just from the egg, measures 4.5 mm. long and 5.5 wide. It has already taken on many adult characters; it is true that the front is long and little deflexed, but it lacks deep, longitudinal furrows; the postorbital portion of the crest is sharp-edged; the outer angle of the orbit is produced and the epibranchial spine well developed.

In some instances, an epibranchial spine is suppressed, as in female, No. 843 (left spine), or lacks a sharp tip, as in male, No. 843 (right spine).

In an old male, No. 841, carapace 19.7 by 28.9 mm., the epibranchial tooth has almost disappeared, remaining on both sides as a low, blunt tubercle; the postorbital part of the crest is almost blunt; the secondary spine of the carpus is reduced to a low tubercle on the larger cheliped and is obsolete on the smaller cheliped; the palm increases greatly in width toward the distal end, the fingers are widely gaping, the immovable finger much deflexed, all the prehensile teeth much worn and very short.

An old male, No. 843, a little smaller than the above, has similar epibranchial tubercles and blunt postorbital crests. The outer orbital angle is less advanced than usual, and there is no sinus below it.

In adult males, but not the oldest, the gape of the fingers is moderate and the enlarged basal teeth are larger than in more gaping fingers.

One male, No. 841, has the large chela abnormally developed; the fingers are strongly arched, the propodal finger curving abruptly down from the palm. When the fingers are widespread, the distance between their tips is 17 mm., between their middles 22 mm.

The figures given by A. Milne Edwards do not adequately represent the species. In reality, the epibranchial spine is very tiny and inconspicuous and the carapace bows out strongly behind it. The crest is not so sharply marked, so even, nor so regularly curved as in the figure. The outer angle of the orbit is not so pointed nor so produced as there represented. The figure does not show the secondary spine on the carpus of the chelipeds nor the prehensile teeth of the fingers.

"These crabs were common about Stanleyville in all the more shallow forest brooks (Pl. LXIV) and probably have a much wider distribution than our collecting would imply. It was only in that place that we took crabs in greater numbers and specially dammed various brooks in native fashion, gathering below such barriers all specimens we could secure with small native nets. It is probable that they can live out of water and are only dependent on a certain amount of moisture. When disturbed they instantly cover themselves with mud or secure protection beneath any object." (H. L.)

Subgenus **GEOTHELPHUSA** Stimpson

Geothelphusa STIMPSON, 1858, Proc. Acad. Nat. Sci. Philadelphia, X, p. 100 [46].

Epigastric and postorbital crests either obsolete, or only partially developed; that is, the epigastric crests slightly developed, while the outer portion of the postorbital crest may be very distinct, even sharp-edged, but separated by a considerable smooth space from the epigastric crest.

Lateral epibranchial spine either indistinct or obsolete.

Potamon (**Geothelphusa**) **congoënsis,** new species

Plates XXVIII, Figure 3, XXIX; Text Figure 11

Type locality.—Nepoko River, above Gamangui; February 1, 1910; 1 ♂.

Holotype.—Male (Amer. Mus. Nat. Hist.).

Localities.—French Congo: Libreville, Gaboon; February 1916; J. P. Chapin, collector; A4518; 4 ♂♂, 2 young. The remainder are from the Belgian Congo. Poko; 10 ♂♂, 17 ♀♀ (one with newly hatched young). Bafwabaka; December 31, 1909; 3 ♂♂, 1 ♀; "above a dark glossy purple, nearly black." Nepoko River, above Gamangui; February 1, 1910; 1 ♂ holotype. Near Bafwasende; September 28, 1909; 1 ♂; "above reddish brown, limbs grayish, abdomen bluish white." Affluent of the Tshopo River, near Stanleyville; No. 884; 1 ♀.

Measurements.—Male holotype: length of carapace, 29 mm.; width, 44 mm. Female (Poko): length of carapace, 23.3 mm.; width, 31.6 mm. Smallest specimen except those just from the egg, female (Libreville): length of carapace, 13.1 mm.; width, 17 mm.

Diagnosis.—Postfrontal crest almost transverse at outer end. Front bilobed. An outer orbital sinus present. Ischial furrow of outer maxillipeds shallow.

Description of old male.—Carapace suboval, smooth, covered with large punctæ visible to the naked eye; depressions in center of carapace deep, also the midbranchial groove and the short median groove which parts the crest; anterior mesogastric region tectiform. A pit on either side at the widest part of the mesogastric region; another pit on the protogastric region in a longitudinal line with the articulation of the eyestalk. Epigastric lobes blunt, oblique, separated by a smooth area from a short, feeble, crenulated crest which begins behind the cornea (when the eye is flat in the orbit) and is continued almost transversely to the lateral margin. In front of it and behind the outer orbital angle, there is a rounded seal-like pit. Edge of front distinctly bilobed, sides oblique, forming an angle with the anterior edge. Upper margin of orbit sloping backward and outward a little, sinuous; outer angle of orbit obtuse, little prominent, the outer sinus is broad, shallow and rounded at bottom; lower edge transverse, regularly tuberculate or crenulate. Anterolateral border of carapace lightly margined, coarsely punctate; the portion in front of the crest is curved downward; posterolateral border with a deep concavity.

Palp of mandible two-jointed; terminal joint simple. A shallow furrow on the ischium of the outer maxilliped, a little nearer the inner than the outer margin; outer margin of merus arcuate, forming a slight angle with the anterior margin; exognath bearing a long, plumose palp.

Chelipeds very unequal; superodistal prominence on inferior surface of merus low, surmounted by a bead tubercle, with two or three tubercles clustered around it; primary spine of carpus short, conical, acute; secondary spine very small, broad, and situated at the end of a denticulate ridge. Larger propodus one and one-half times as long, through the middle, as its distal or greatest height; lower margin convex; propodal finger curved, deflexed; fingers armed with small irregular teeth, and widely gaping. The fingers of the smaller chela almost meet when closed.

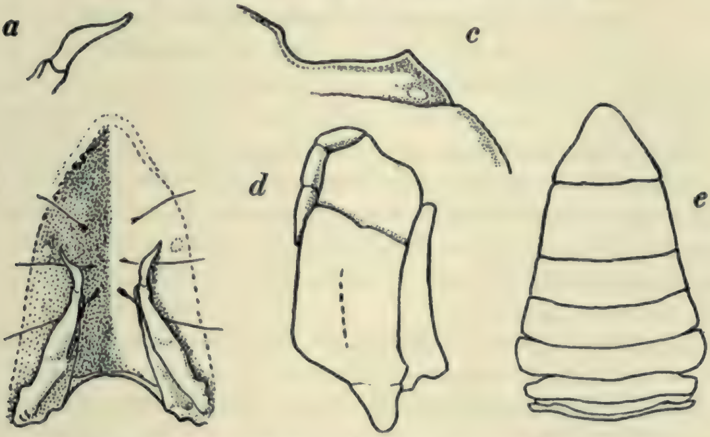


Fig. 11. *Potamon (Geothelphusa) congoënsis*, male.

A, tip of appendage of first abdominal segment of specimen 40.2 mm. wide from Bafwabaka; *b*, appendages of same segment, in sternal cavity; *c*, anterolateral portion of carapace showing extent of postorbital crest, of Bafwasende specimen 36 mm. wide; *d*, outer maxilliped of same specimen as *a* and *b*; *e*, abdomen of same.

The spines of the dactyli of the ambulatory legs increase in size toward the tip of the segment.

The transverse groove on the sternum which connects the two maxillipeds is very deep; behind it, on either side, a short, deep groove runs inward just in front of the cheliped.[3]

Abdomen narrow-triangular; sides of fifth and sixth segments feebly or partially concave; sides of terminal segment more deeply concave. The extremity of the appendages of the first segment curves outward and is produced in a slender tip.

Newly hatched specimens.—Carapace, 2.7 mm. long, 2.9 mm. wide. Lateral margin (from the anterolateral to the posterolateral angle) gently convex; anterolateral angle not advanced; crest wanting; front long, little deflexed, its sides subparallel, a deep median furrow throughout its length, back to the mesogastric region, which is completely delimited.

The short, sharp, outer crest may be lacking altogether (one male from Bafwabaka) or, as more often happens, may be continued inward as far as a point behind the articulation of the eyestalk (male from Bafwasende). In specimens of medium size, the crest is more oblique or directed more backward and outward than in the old. Occasionally the crest is a little scalloped. In some specimens the intermediate portion of the mesogastric region is more definitely limited (female from Bafwabaka). The protogastric pits may be very slightly impressed. In carapaces of 35 mm. in width and less the anterolateral margin is sharply margined and denticulate in inverse proportion to the size. The outer sinus of the orbit may be more distinctly V-shaped than in the old, but even then, it is a little rounded at the base. In smaller specimens the ischial furrow of the maxilliped is deeper. In many adult, but not full-grown, individuals the deep, oblique furrows of the sternum are continued quite to the abdominal cavity. In male specimens of medium size and age (carapace up to 36 mm. wide), the major cheliped is not strikingly larger than the minor one, and the gape of its fingers is moderate.

This species is related to the East African species *emini*,[1] of which I have no specimens at hand for comparison. *Emini* was never figured by Hilgendorf, its author, and I am doubtful whether the Selti specimen which I tentatively referred to this species in 1904 and 1905 is really conspecific with the types.

P. emini is a much smaller species than *congoënsis;* its postorbital crest is short and directed forward at the outer end; the lower edge of the front is nearly straight; the furrow on the ischium of the outer maxilliped is deeper.

P. congoënsis is also very close to *P.* (*P.*) *didieri*,[2] although placed in a different subgenus. When specimens of similar size are compared, the carapace is wider in *congoënsis* in relation to its length, but is more constricted posteriorly. The epigastric lobes are more oblique and are separated from the intermediate part of the crest by a wider interval; the intermediate part of the crest is less sharply marked; the outer part is straighter, less sinuous. The sides of the front are much more convergent and, in consequence, its lower edge is much narrower than in

---

[1] *Telphusa emini* Hilgendorf, 1892, Sitzungsber. Ges. Naturf. Freunde Berlin, p. 11. *Potamon* (*Geothelphusa*) *emini* Rathbun, 1904, Nouv. Arch. Mus. Hist. Nat., Paris, (4) VI, Pl. XVIII [X of Potamonidæ], fig. 9; 1905, (4) VII, p. 200, text-fig. 49.

[2] *Potamon* (*Potamonautes*) *didieri* Rathbun, 1904, Nouv. Arch. Mus. Hist. Nat., Paris, (4) VI, Pl. XIV [VI of Potamonidæ], fig. 9; 1905, (4) VII, p. 170.

didieri. The anterolateral regions are considerably smoother than in *didieri*. The anterolateral margin of the merus of the outer maxilliped is more angular; in *didieri* that margin is a single curve to the insertion of the palpus. The exognath is shorter, not reaching beyond middle of merus.

"The nearly black upper surface of the carapace shows a distinct purplish hue which is much paler on the big shears. The limbs are mottled with dirty yellow; the eye-stalks have an orange tint. Most of the under side is pale grayish yellow, somewhat stronger than that on the abdomen and lower side of the legs. About the mouth-parts the color is a grayish blue. At Poko specimens of *Potamon* (*Geothelphusa*) *congoënsis* were caught in small native fish-traps baited with decomposed manioc to attract the small silurids in one of the heavily forested affluents (Pl. LXIV) of the Bomokandi River." (H. L.)

Potamon (**Geothelphusa**) **perparvus**, new species

Plates XXVIII, Figure 2, XXX; Text Figure 12

Type locality.—Stanleyville; August 12, 1909; 2 ♂♂.

Holotype.—Male (Amer. Mus. Nat. Hist.).

Localities.—This species was taken only at Stanleyville and vicinity. The different lots were distributed as follows. August 21, 1909; 2 ♂♂ (1 is holotype); "dark brown, lighter toward abdomen, with tinge of red; shears a tinge of purple; abdomen whitish gray." From affluent of Tshopo River; April 1915; No. 841; 2 ♂♂, 1 ♀ young. From forest brooks; April 1915; No. 844, 1 ♂, 1 ♀; No. 847, 3 ♂♂, 1 ♀. April 1915; No. 932, 1 ♀ immature; No. 944, 3 ♀♀. May 1915; No. 945; 1 ♂.

Measurements.—Male holotype: length of carapace, 13.6; width of same, 19.6; fronto-orbital width, 13.7 mm. Largest female, No. 944: length of carapace, 12.4; width of same, 17.2; fronto-orbital width, 12.6 mm.

Diagnosis.—Postfrontal crest curved forward at outer end. Edge of front with a small median lobe. Maximum width of carapace about 2 cm. No outer orbital sinus. Ischial furrow of outer maxillipeds deep.

Description of type male.—Although the specimens are all small, the larger ones appear to be full grown. The carapace is very convex, the anterior portion inclined strongly downward, the lateral portions inclined moderately. Surface rather densely punctate; furrows deep on posterior half, the cardiac region wholly delimited; the furrow crossing the branchial region at its middle is noticeable, as is also one just in front of its posterior margin. Epigastric lobes low and smooth; a short carinated crest is situated behind the outer half of the orbit; it is nearly parallel to the orbital margin, is lightly sinuous and reaches the lateral margin of the carapace.

The margin of the front (between the eyes) is not visible in a strictly dorsal view, but, when the carapace is tipped back a little, it is seen to be sinuous, or trilobed, there being a small median lobule; viewed from in front, the edge is nearly transverse; it meets the slightly oblique lateral edges with a rounded angle. Upper margin of orbit sinuous and directed forward and outward to the outer angle, which is obtuse and not at all prominent. The lateral border of the carapace is margined as far back as the widest part of the carapace, where it fades out gradually; that part of the margin lying in front of the crest curves strongly downward.

There is no sinus in the outer margin of the orbit. The lower surface of the carapace is almost smooth (devoid of granulation). The efferent branchial openings are large in proportion to the size of the crab and are transversely oblong. The mandible has a two-jointed palp, the last joint simple. The ischium of the outer maxillipeds is deeply furrowed, the furrow being approximately at the middle of the segment but a trifle nearer the inner edge: the merus is distinctly wider than long, outer margin very arcuate, anterior margin, outside the articulation of the palp, almost transverse. The palp of the exognath is of good length.

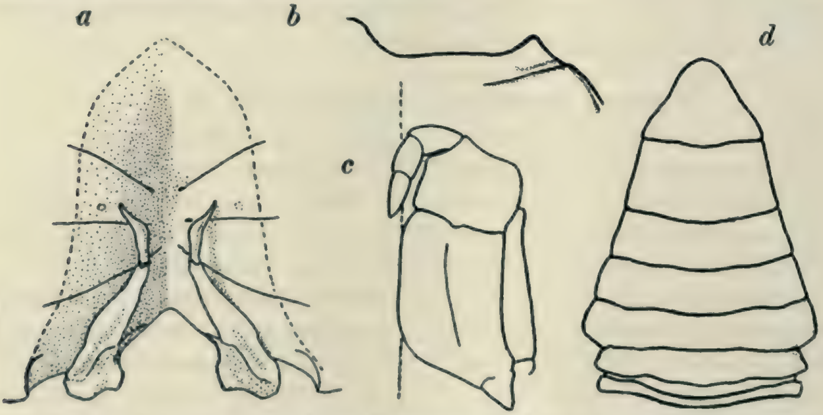


Fig. 12. *Potamon* (*Geothelphusa*) *perparvus*, male, 18.3 wide, Tshopo River.

A, appendages of first abdominal segment, in sternal cavity; *b*, anterolateral portion of carapace showing extent of postorbital crest; *c*, outer maxilliped; *d*, abdomen.

Chelipeds very unequal; protuberance at upper distal angle of lower surface stout, conical, tuberculate; two conical spines on the carpus, the secondary one much the smaller; larger palm much swollen, fingers moderately gaping, their fine, triangular, prehensile teeth interspersed with three or four larger ones. The smaller palm is inflated laterally but scarcely in a vertical direction, and the fingers have a very narrow interspace.

The anterior sternum has two deep, hairy grooves, one between the maxillipeds, the other a broken line which nearly touches the tip of the abdominal cavity.

The male abdomen tapers regularly from the third to the sixth segment inclusive, but the triangular seventh segment is a little wider at its base than the adjacent part of the sixth segment. The appendage of the first segment is similar to that of *P.* (*G.*) *congoënsis*.

This species is the counterpart in West Central Africa of *P.* (*G.*) *emini* (see page 424) of East Central Africa. It resembles *emini* in its small size and in many other characters; the principal difference is that the fronto-orbital distance is greater than in *emini*, more than two-thirds of the width of the carapace instead of just two-thirds, and that the lateral margins are much less bowed outward. The regions of the carapace are more strongly defined than in *emini*.

P. (*G.*) *perparvus* is also related to *P.* (*G.*) *congoënsis*, but is more convex and of smaller size; the upper median point of the epistome is produced in the edge of the front so as to form a median lobe in the latter, a lobe which does not exist in *congoënsis;* the postfrontal crest curves forward at its outer end almost parallel with the orbital margin, while in *congoënsis* the crest is transverse or inclines a little backward at that point. *P. perparvus* has no outer orbital sinus, *congoënsis* has one; the former has a deep furrow on the ischiognath, the latter a shallow one; the groove bordering the distal end of the male abdominal cavity is pointed in *perparvus*, arcuate in *congoënsis*.

The chelipeds of the adult female are very small, subequal, and partake more of the character of the minor cheliped of the adult male. The same is true in general of immature individuals of both sexes. However, a male only 14.9 mm. wide, No. 847, shows a decided inequality in chelipeds.

The anterolateral margin of the carapace of all but the largest specimens is sharper and more denticulate than in the type and shows a definite posterior termination on the dorsal surface.

The efferent branchial openings vary from transversely oblong to oval (female, No. 844).

"Taken from a forest brooklet, the first left affluent below the falls of the Tshopo River near Stanleyville (Pl. LXIII). The shallow bed was only a few feet across at most and the running water hardly as many inches wide. The whole was practically covered by abundant vegetable débris with only a few blotches of white sand between and here and there little stagnant pools. These environmental conditions would rather encourage partially land-living habits. The smooth, roundish, unarmed carapace of this tiny crab should facilitate getting about among moist leaves. The dark brown color of the upper surface has a tinge of red and is lighter toward the abdomen. The big shears are purplish and the abdomen is whitish gray." (H. L.)

Subgenus **ACANTHOTHELPHUSA** Ortmann

Acanthothelphusa ORTMANN, 1897, Zool. Jahrb., Syst., X, pp. 299, 300.

Anterolateral borders of carapace strongly laciniate or spinose. Upper border of merus of chelipeds without a subterminal spine. The crest may be unbroken as in *Potamonautes* or interrupted as in subgenus *Potamon*.

Potamon (Acanthothelphusa) faradjensis, new species

Plate XXXI; Text Figure 13

Type locality.—Faradje, Belgian Congo; December 1912; No. 516; 1 ♂.

Holotype.—Male (Amer. Mus. Nat. Hist.).

Localities.—Faradje: December 1912, No. 516, 1 ♂ holotype; No. 518, 1 ♀ mature; from Dungu River, 1 ♀ immature, "color above nearly black." Faradje; March 7, 1912; 1 ♂, 1 ♀. Vankerckhovenville; April 1912; No. 414, 1 ♂.

Measurements.—Male holotype: length of carapace, 52; width of same, inclusive of spines, 74 mm. Female, Faradje, No. 518: length of carapace, 49; width of same, inclusive of spines, 68.5 mm.

Diagnosis.—Lateral border with two large spines and many spinules. Exorbital spine acute. Secondary spine of carpus well developed.

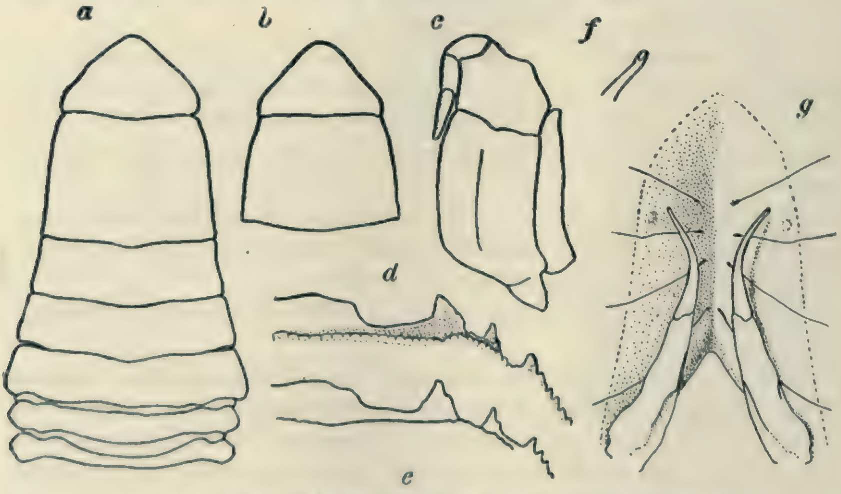


Fig. 13. *Potamon* (*Acanthothelphusa*) *faradjensis*, Faradje.

A, abdomen of male holotype, carapace 74 mm. wide; *b*, last two segments of abdomen of a male 49 mm. wide; *c*, outer maxilliped of holotype; *d*, right, anterior portion of carapace of female 68.5 mm. wide; *e*, right, anterior portion of carapace of holotype; *f*, tip of appendage of first abdominal segment of same; *g*, appendages of first abdominal segment of same.

Description.—Carapace rough with crowded, blister-like granules, which are largest on the anterolateral regions, least prominent on the mesogastric region. Central part of carapace areolated; groove separating mesogastric from branchiocardiac regions deep; urogastric lobes and cardiac regions strongly marked; an areole occupying the inner angle of the branchial region and extending into the protogastric region is limited by shallow grooves and small pits. Anterior part of cervical suture faint, but may be seen crossing the postfrontal crest behind the outer half of the exorbital tooth. Anterior end of mesogastric region well marked; from it a deep groove makes a V-shaped sinus in the postfrontal crest. Intestinal region depressed.

Postfrontal crest transverse, edge crenulate, projecting forward, the surface in front of it being on a much lower level; toward the outer ends it curves backward, at the same time becoming more uneven, until it joins the lateral margin. At the point of union there is a slender spine or tooth; this is followed by seven or eight small, irregular serrations. The front, between the eyes, is, in its greatest width, one-third the width of the carapace; on either half there is a cluster of raised granules; the edge is bilobed, its outer angles are obliquely truncated, and the sides are oblique and elevated. Upper margin of orbit transverse, outer tooth almost an equilateral triangle, its outer edge slightly convex. Between the outer orbital tooth and the tooth at the end of the crest, and separated from each by a broad U-shaped sinus, there is a sharp-pointed, conical, forward-pointing tooth. The outer orbital sinus is V-shaped; the lower margin of the orbit is crenulated and more advanced than the upper margin.

Middle lobe of epistome very prominent. Mandibular palp three-jointed; terminal joint simple but expanded at the base, showing a tendency toward the bilobed form. Furrow on ischium of outer maxillipeds well marked and nearer the inner than the outer margin; the antero-external margin of the merus is angled.

Chelipeds of fully developed male very unequal; a slender spine at the distal end of the inner surface of the merus; and, along the upper edge of this surface, two rows of tubercles or blunt spines. The larger spine at the inner angle of the carpus is long and strong; the secondary spine is equally sharp but much smaller. Surface of palms reticulated and punctate; upper and lower margins convex; fingers long, slightly deflexed, grooved, tips dark brown and crossing when closed; in the larger chela, each finger has two large teeth, which are situated at the base of the dactylus and near the base of the immovable finger in such a way that the opposing teeth meet and form a small gape at the base, cut off from the long gape farther on; in the smaller chela the teeth are all very small and the fingers almost meet when shut.

Ambulatory legs of moderate length; upper margin of merus joints hairy, also upper margin of carpus and both margins of propodus of last pair. Dactylus of last pair much shorter and proportionally much wider than of the second and third pairs; in addition to the four customary rows of marginal spinules, there is on the upper surface near the tip a larger recurved spine similar to the terminal one, giving the tip in sidewise view a bispinose appearance. A stridulating apparatus is present on the coxæ of the first and second legs and on the corresponding branchiostegal edge of the carapace.

Length of sixth segment of male abdomen a little less than distal width, length of seventh segment about three-fifths of its width.

Closely related to *P.* (*A.*) *chaperi* (A. Milne Edwards)[1] from Guinea; in that species, however, the carapace is wider (compare measurements of females) and less deeply areolated, the front less advanced, the orbits less deeply cut so that the outer orbital tooth is much broader than long, and the secondary spine of the carpus of the chelipeds is lacking.

---

[1] *Parathelphusa chaperi* A. Milne Edwards, 1887, Ann. Sci. Nat., Zool., (7) IV, p. 144, Pl. VIII, fig. 4; Assinie *P.* (*Parathelphusa*) *chaperi* RATHBUN, 1905, Nouv. Arch. Mus. Hist. Nat., Paris, (4) VII, p. 262, Pl. XIV [XII of Potamonidæ], fig. 6.

In the two small males, the lateral margins of the terminal segment of the abdomen are more sinuous than in the type and the abdomen is slightly constricted at the distal end of the sixth segment.

The large female (No. 518) is proportionally narrower than the type male and the upper margin of the orbit slants forward and outward instead of being transverse. The orbit is more or less oblique in all the other specimens also. The front varies a little in the sharpness of the angles.

"These handsome, well-modeled crabs are probably the largest among the river crabs of the interior. Their favored haunts are the quiet, stony portions near rapids in larger rivers of the Uele District. Such sites are also the refuges of many large, carnivorous fishes and often of crocodiles, the young of which habitually feed on crabs. These are among the liveliest of river crabs, quick in defense, and rapid in escape. A rather turbulent environment and the many hazards of such a habitat undoubtedly foster these qualities.

"The nearly black color of these crabs helps render them invisible and the flatness of the carapace facilitates an easy retreat between or beneath stones. Even the rather tough, granular carapace with strong lateral spines must often secure them immunity from many enemies." (H. L.)

Potamon (**Acanthothelphusa**) **langi**,[1] new species

Plate XXXII; Text Figure 14

Type locality.—Congo River, at Stanleyville; April 1915; No. 838; 3 ♂♂, 5 ♀♀ (3 ovigerous).

Holotype.—Male (Amer. Mus. Nat. Hist.).

Localities.—Leopoldville: August 11, 1909; 1 ♀; "greenish brown above; caught near the shore." The following are all from Stanleyville. August 8, 1909; 1 ♀; "caught on the shore; above dark brownish green." August 14, 1909; 1 ♀; "above dark greenish brown, below gray-yellow." August 15, 1909; 4 ♀♀; "above brownish with a tinge of yellow; common under logs in the water." August 17, 1909; 1 ♀. August 18, 1909; 1 ♂; "brownish above, below brownish gray." August 20, 1909; 1 ♀ ovig.; "above dark greenish brown, abdomen whitish gray and brown." August 21, 1909; 1 ♀. August 28, 1909: 2 ♀♀, "dark brownish green"; 1 ♀ ovig., "dark greenish gray." February 1915; 1 ♂, 13 ♀♀ (8 ovig.). April 1915: No. 832, from Congo River, 1 ♂, 10 ♀♀ (4 ovig.);

---

[1] Named in honor of Mr. Herbert Lang, leader of the Congo Expedition.

No. 833, 3 ♀♀ (2 ovig.); No. 834, from Congo River, 3 ♂♂, 8 ♀♀ (5 ovig.), 1 young; No. 835, from Congo River, 7 ♂♂, 21 ♀♀ (6 ovig.); No. 836, from Congo River, 2 ♂♂, 11 ♀♀ (5 ovig.); No. 837, from Congo River, 3 ♂♂, 16 ♀♀ (8 ovig.), 3 young; No. 838, 3 ♂♂, 5 ♀♀ (3 ovig.), 1 ♂ is holotype; No. 839, 2 ♀♀ ovig; No. 840; 2 ♀♀ ovig.

Measurements.—Male holotype: length of carapace, 35.4; width of same, exclusive of spines, 46; width inclusive of spines, 49 mm.

Diagnosis.—Four strong lateral spines. Epigastric and protogastric crests continuous. Anterior mesogastric region feebly outlined. Front between eyes one-third as wide as carapace.

Description.—Surface of carapace rather uniformly covered with fine, depressed, confluent granules, and irregularly spaced punctæ; fine, inconspicuous striæ near the lateral borders. Depressions in center of carapace deep; outer part of cervical suture obsolete except for a large depression in which there is a short thumb-nail imprint. Epigastric and protogastric portions of postfrontal crest continuous, strong except near outer ends; crest granulate, divided on median line by a short deep groove; the two halves oblique and nearly straight. Front, measured on anterior or lower end, about one-third as wide as greatest width of carapace; edge obscurely bilobed, outer corners rounded. Outer orbital tooth acute; outer margin sinuous, subentire, and very finely serrulate. Four strong lateral spines, the anterior of which is at the end of the postfrontal crest.

Mandibular palp two-jointed; terminal segment simple. Merus of outer maxilliped definitely broader than long, antero-external border arcuate; ischial furrow obsolete.

Chelipeds of well-developed male very unequal; a sharp spine just below the anterior margin of the merus and midway of its length; two long sharp spines on the inner margin of the carpus, the secondary spine of important size; larger palm increasing in height distally, fingers long, slender, and widely gaping, teeth very irregular; palm of smaller cheliped increasing in width but little toward the distal end, fingers long, very slender, and almost meeting.

Ambulatory legs elongate, merus joints not dilated.

Related to *P.* (*A.*) *niloticus* (Milne Edwards), in which lateral spines are smaller and more numerous on the carapace, spinules are present on the outer slope of the orbital tooth, the narrow part of the mesogastric region is deeply defined, the cervical groove is continued to the postfrontal crest, the spine on the merus of the chelipeds is stouter and less clear cut, the secondary spine of the carpus is smaller, and the abdomen of male wider.

In specimens of small and medium size the outer extremities of the postfrontal crest may be interrupted or disappear altogether. The lateral spines vary in number from three to six, although four is the normal number, and may be different on opposite sides of the same individual.

"A strictly fluviatile crab that prefers the quieter stretches where floating material accumulates and sunken logs offer suitable protection. It is quick in hiding and when pursued dives even into the mud. Apparently it is fond of putrid or baked manioc for many of the specimens were caught in native fish-traps baited with this substance and laid in the deeper, miry places where small silurids and certain mormyrids were habitually taken.

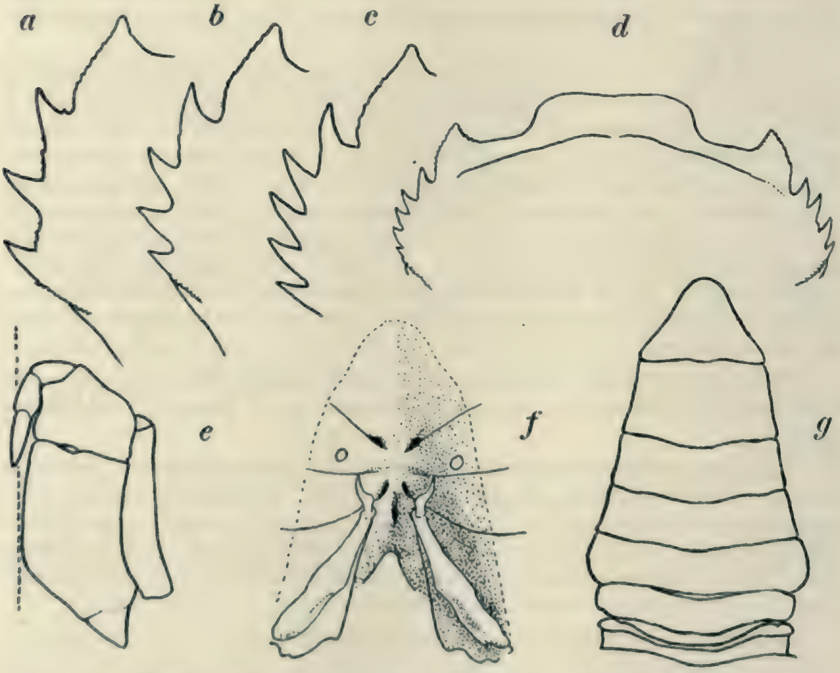


Fig. 14. *Potamon* (*Acanthothelphusa*) *langi*, Stanleyville.

A, three-spined anterolateral margin of carapace of female 41 mm. wide; *b*, four-spined anterolateral margin of carapace of female 40 mm. wide; *c*, five-spined anterolateral margin of carapace of male 42.8 mm .wide; *d*, anterior part of carapace of young male 20 mm. wide, showing disappearance of crest near lateral margin; *e*, outer maxilliped of male 48 mm. wide; *f*, appendages of first abdominal segment, in sternal cavity, of same specimen; *g*, abdomen of same.

"The color is undoubtedly protective; the upper side is dark brownish green, of a tone, however, that makes it difficult to state whether brown or green predominates; in some it appears even yellowish. The differences in shade may depend partly on the environment and partly on the degree to which the carapace has been hardened; those newly shed are much lighter, but none of these have been preserved." (H. L.)

Erimetopus Rathbun

Erimetopus Rathbun, 1894, Proc. U. S. Nat. Mus., XVII, p. 26; 1905, Nouv. Arch. Mus. Hist. Nat., Paris, (4) VII, p. 270. Ortmann, 1903, Proc. Amer. Philos. Soc., XLI, p. 300.

Fronto-orbital width small; front narrow, much advanced. Orbits small; eyes still smaller, cylindrical, the cornea not covering the end of the stalk.

Epistome short (fore and aft); antennular cavities correspondingly large. Mandibular palp composed of two distinct joints, terminal joint simple.

Outer maxillipeds as in *Potamon;* no ischial furrow.

Merus joints of chelipeds and legs armed with a subterminal spine; wrist with two strong inner spines and a row of smaller spines on anterior border. Carpus and propodus of ambulatory legs armed with spines on anterior margin and propodus of last pair with spines on posterior margin.

Eggs small and numerous.

Erimetopus brazzæ (A. Milne Edwards)

Plate XXXIII; Text Figure 15

Thelphusa brazzæ A. Milne Edwards, 1886, Bull. Soc. Philom. Paris, (7) X, p. 148.

Parathelphusa brazzæ A. Milne Edwards, 1887, Ann. Sci. Nat., Zool., (7) IV, p. 142, Pl. vii, fig. 6. De Man, 1898, Ann. Mus. Civ. Stor. Nat. Genova, (2) XIX, p. 438 [57].

Erimetopus spinosus Rathbun, 1894, Proc. U. S. Nat. Mus., XVII, p. 26.

Potamon (Acanthothelphusa) brazzæ Ortmann, 1897, Zool. Jahrb., Syst., X, p. 300.

Erimetopus brazzæ Rathbun, 1905, Nouv. Arch. Mus. Hist. Nat., Paris, (4) VII, p. 270, text-fig. 73, Pl. xxi [xix of Potamonidæ], fig. 8.

Locality.—Leopoldville; July 11, 1909; 1 ovig. ♀; "grayish brown; caught on the shore under a piece of tin."

Range.—Previously taken at Gaboon and Ngancin, French Congo, and at Stanley Pool, on whose shores is Leopoldville. The male is not known.

Measurements.—Female from Leopoldville: length of carapace, 20.2; width of same, 26; fronto-orbital width, 15.2; diameter of eggs, 1.5 mm.

Description.—Carapace narrow, almost horizontal from side to side, anterior third inclined downward. Anterolateral margins very oblique, posterolateral little converging. Cardiac and posterior part of mesogastric region defined; a shallow median groove marks the narrow portion of the mesogastric region; the lateral portion of the cervical groove is indicated by a roundish depression at the widest part of the carapace.

Epigastric lobes smooth, low; in large specimens no other part of the crest is developed; in small specimens there is an indistinct arcuate ridge, crenulate or granulate, beginning behind the orbital tooth and continued toward the largest epibranchial spine.

Front narrow, inclined, prominent, far advanced beyond the antennular cavities, deeply bilobed, sinus V-shaped, sides very oblique, margin crenulate.

Orbits small, almost semicircular in dorsal view, upper margin granulate or denticulate, outer angle a strong inward-pointing spine, which is followed by a number (four to eight or even more) of smaller irregular spines on the margin of the hepatic region. Farther back and higher up there is a strong epibranchial spine, sometimes bifid, followed by from three to five smaller spines, all of which are strongly upturned. The lateral marginal line ends midway of the length of the carapace. Orbit nearly horizontal in front view, lower margin crenulate or granulate, without tooth at inner angle. The eyestalks taper a little to the end.

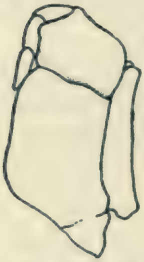


Fig. 15. *Erimetopus brazzæ*, female 35 mm. wide, U. S. N. M. No. 18066. Outer maxilliped.

Under surface of carapace nearly smooth. Merus of maxilliped much broader than long, antero-external angle rounded.

Chelipeds of female similar, not very unequal. Lower surface of arm bordered on three sides by tubercles and spinules; upper margin also spinulous, with a subterminal spine. Palms unarmed; fingers elongate, narrowly gaping.

Ambulatory legs of moderate length, rather broad, the merus joints have a subterminal and a terminal spine. The propodal joints have two terminal spines below, while those of the last pair have spines also along the posterior margin. Spines of dactylus strong and directed away from the segment. All the spines of carapace and legs have corneous tips.

Abdomen of female very large.

Deckeniinæ

Deckeniinæ Ortmann, 1897, Zool. Jahrb., Syst., X, pp. 297 and 314; 1903, Proc. Amer. Philos. Soc., XLI, p. 305.

Differs from the other Potamonidæ and approaches the subtribe Oxystomata in the disposition of the efferent branchial channels, which are prolonged to the frontal border and open between the antennular cavities and the orbits. The antennæ are lodged entirely at the inner end of the orbital cavity. Antennulæ longitudinal. Merus of outer maxillipeds allied to that of the Pseudothelphusinæ, the anterolateral margin broadly rounded, the palpus articulated just inside the apex.

Mandibular palp composed of two distinct segments; terminal joint simple in *Deckenia imitatrix* and *D. mitis*, but distinctly bilobed in *D. alluaudi*.

Deckenia Hilgendorf

Deckenia Hilgendorf, 1868, Sitzungsber. Ges. Naturf. Freunde Berlin, p. 2; 1869, in von der Decken, Reisen in Ost-Afrika, Zool., III, p. 77; 1898, Deutsch-Ost-Afrika, IV, Lief. IX, Dekap., p. 23. Rathbun, 1906, Nouv. Arch. Mus. Hist. Nat., Paris, (4) VIII, p. 69, and references to literature.

Carapace cordiform, very convex from front to back. One epibranchial tooth present. Anterolateral border sharp. Front narrow, triangular. None of the abdominal segments fused.

Deckenia mitis Hilgendorf

Plate XXXIV; Text Figure 16

Deckenia mitis Hilgendorf, 1898, Deutsch-Ost-Afrika, IV, Lief. IX, Dekap., p. 24, fig. 8. Ortmann, 1903, Proc. Amer. Philos. Soc., XLI, p. 306. Rathbun, 1906, Nouv. Arch. Mus. Hist. Nat., Paris, (4) VIII, p. 71, text-fig. 123, Pl. xxi [xix of Potamonidæ], fig. 7.

Locality.—River near Comarock, Athi Plains, British East Africa; 1906 (H. Lang, collector); 2 ♂♂, 1 ♀. Small and immature specimens in bad condition, having dried out. "Common beneath stones and accumulated dead vegetation in a small brook."

Range.—British East Africa: Mombasa. German East Africa: Tanga; Daressalaam; Wembere Steppe.

Measurements.—Male, Mombasa (U. S. N. M.): length of carapace, 34.1; width, 40 mm.

Description of specimens in U. S. National Museum.—Carapace very convex from side to side as well as from front to back; smooth, with scarcely any separation between regions; epigastric lobes smooth, little elevated; no postorbital crest. Frontal, upper orbital and anterolateral margin, a narrow, acute rim. Epibranchial tooth small, subacute, not far from orbit. Front with a narrow median lobe, scarcely projecting beyond the efferent tubes; lateral lobes oblique, confluent with the upper margin of the orbit, which also is oblique, sinuous, sloping back to the broad, subacute outer angle. The anterolateral marginal line runs up on the carapace and terminates opposite the anterior part of the cardiac region; the posterolateral border is crossed by a few sharp striæ.

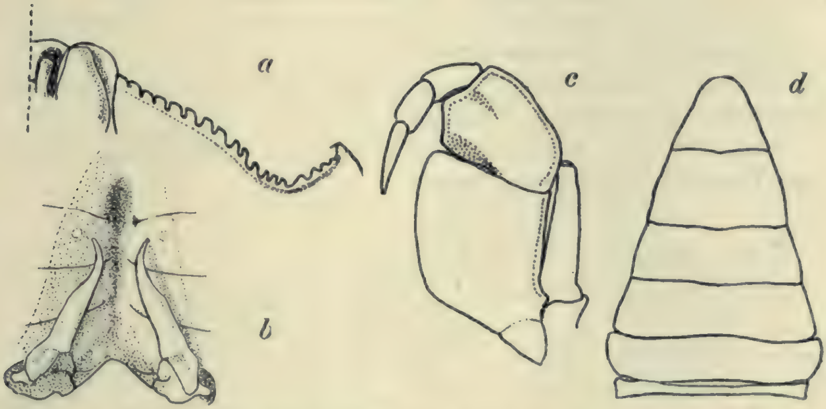


Fig. 16. *Deckenia mitis*, male 36 mm. wide, U. S. N. M. No. 32298.

A, lower margin of orbit, with antennæ; left dotted line represents the median line; *b*, appendages of first abdominal segment, in sternal cavity; *c*, outer maxilliped; *d*, abdomen.

The lower margin of the orbit is very oblique and is armed with more or less spinous teeth, which are slightly curved inward; those at the inner half of the orbit are truncate; toward the outer angle of the orbit the teeth become gradually narrower and more acute. The subhepatic region is short, compared to its width, and bears a transverse, curved, broken, and finely granulate line, similar to the oblique striæ of the subbranchial region.

The antero-external border of the merus of the maxilliped forms a continuous curve to the apex of the segment. No furrow on the ischium.

Chelipeds subequal and rather small, except the larger one in the old male. The ischium has a broad spine on its inner edge; the merus has a similar, subterminal spine above; its lower surface, including the outer terminal lobe, is bordered by blunt spines or tubercles, with a larger one at middle of inner edge; carpus armed with two equal inner spines anteriorly placed; the distal margin, outside the articulation, is spinulous. Fingers long, finely toothed, narrowly or not at all gaping.

Ambulatory legs broad, compressed, including even the dactyls. The merus joints have a very short, subterminal tooth.

The abdomen of the male reaches nearly as far forward as the anterior base of the chelipeds.

Color, according to Hilgendorf, violet; finger brownish; under side light violet. Female light brownish with fine violet dots.

Xanthidæ

Menippe de Haan

Menippe de Haan, 1833, Fauna Japon., Crust., pp. 4 and 21.

Menippe nanus A. Milne Edwards and Bouvier

Plate XXXV, Figures 1 and 2; Text Figure 17

Menippe nanus A. Milne Edwards and Bouvier, 1898, Bull. Mus. Hist. Nat., Paris, IV, p. 185; 1900, Expéd. Sci. Travailleur et Talisman, 1880–1883, Crust. Déc., part 1, p. 80, Pl. xv, figs. 9 and 10.

Locality.—Padron Point; August 1915; 1 ♂. "From a coral reef south of it, was clinging to a sea-fan."

Range.—Taken previously only at the type locality, off La Praya, Cape Verde Islands, 10 to 30 meters.

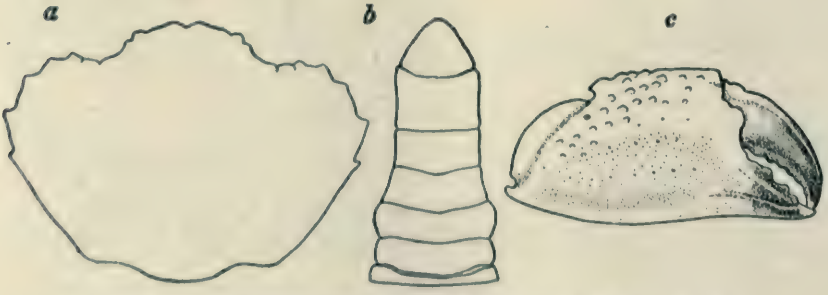


Fig. 17. *Menippe nanus*, male 10.7 mm. wide, Padron Point. *A*, outline of carapace; *b*, abdomen; *c*, right, major chela.

Measurements.—Length of carapace of male, 7.4 mm.; width of same, 10.7 mm. This specimen is almost half again as large as the larger of the cotypes.

Description.—This is by far the smallest species of *Menippe*. The carapace is suboval; the grooves delimiting the gastric and the mesogastric regions are well marked. The anterior and anterolateral area is roughened with granulated elevations;

one of these is on each frontal region, three (one in front of the other two) on each epigastric region, while two irregular and oblique ridges cross the anterolateral area.

Front cut into two oblique lobes separated by a deep sinus and subdivided into three lobes, the middle one of which is very shallow, the outer one small but prominent. The orbit has a slight superior inner angle, two superior fissures, a small tooth at the outer angle, a larger tooth directly below it, and a large lobe at the inferior inner angle. Anterolateral teeth five, the last four much larger than the one at the orbit. A short, deep groove in front of the last tooth. Carapace widest at the penultimate tooth.

The chelipeds are unequal and are covered dorsally (manus and carpus) with unequal, spaced granules, which extend about half-way down the outer surface of the manus. Fingers grooved, light brown, the color not reaching quite to the proximal end of either finger.

Margins of legs hairy, especially those of the propodus and dactylus and the superior margin of the carpus.

Pilumnus Leach

Pilumnus Leach, 1815, Trans. Linn. Soc. London, XI, pp. 309 and 321.

Pilumnus verrucosipes Stimpson

Plates XXXV, Figure 3, XXXVI, Figure 1; Text Figure 18

Pilumnus verrucosipes Stimpson, 1858, Proc. Acad. Nat. Sci. Philadelphia, X, p. 36, Simons Bay, Cape of Good Hope, 11 fathoms; 1907, Smithsonian Misc. Coll., XLIX, p. 67, Pl. viii (facing p. 66), fig. 5 (12 fathoms). Miers, 1881, Ann. Mag. Nat. Hist., (5) VIII, p. 216, Pl. xiii, fig. 5. Doflein, 1904, Brachyura 'Valdivia' 1898-1899, VI, p. 100; Atlas, Pl. xxxii, figs. 3 and 4 (♀).

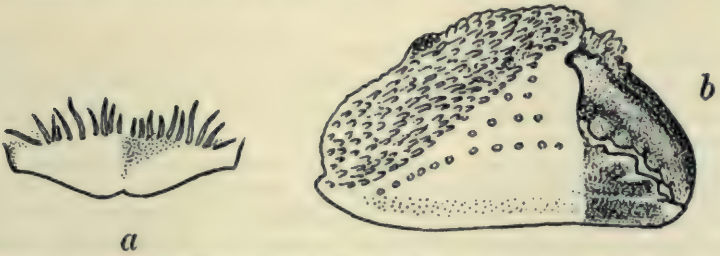


Fig. 18. *Pilumnus verrucosipes*, female 9.6 mm. wide, St. Paul de Loanda. *A*, front of carapace viewed from before; *b*, right, major chela.

Locality.—St. Paul de Loanda: September 21, 1915, 1 young; September 23, 1915, 1 ♀. "At a depth of four feet, from a sponge."

Range.—From Gorée Bay, Senegambia, 9 to 15 fathoms (Miers), to Plettenbergs Bay, Cape Colony, shallow water (Doflein).

Measurements.—Length of carapace of male, 7.6; width, 10.7 mm. (Stimpson). Length of carapace of female from St. Paul de Loanda, 7.1; width, 9.6 mm.

Description.—Upper surface of body and feet minutely pubescent, with scattered long clavate setæ, most conspicuous on the margins of the feet and in a transverse line behind the front. Surface toward the anterior margins somewhat areolate; a strong protuberance near the middle lateral tooth. Front and anterolateral teeth free from pubescence. Front projecting, slightly emarginate at middle, lobes oblique. Anterolateral margin with three projecting, obtuse teeth, in addition to the angle of the orbit. Inferior margin of the orbit thick and protuberant, especially at the inner angle. Feet all verrucose above. In the cheliped, the carpus bears nine large verrucæ; hand with four, dactylus with one, verruca on the upper edge; larger hand sparsely granulous externally, smooth and glossy below; smaller hand with outer surface granulous and pubescent. In the ambulatory legs, the penult and antepenultimate segments have each two large warts above.

Panopeus A. Milne Edwards

Panopeus A. Milne Edwards, 1834, Hist. Nat. Crust., I, p. 403.

Panopeus africanus A. Milne Edwards

Plate XXXVII; Text Figure 19

Panopeus africanus A. Milne Edwards, 1867, Ann. Soc. Entom. France, (4) VII, p. 276.

?Panopeus herbstii Osorio (not Milne Edwards), 1887, Jorn. Sci. Lisboa, XI, p. 224; 1890, (2) II, p. 45.

Eupanopeus africanus Rathbun, 1898, Bull. Lab. Nat. Hist. State Univ. Iowa, IV, p. 273; 1900, Proc. U. S. Nat. Mus., XXII, p. 287. De Man, 1900, Mém. Soc. Zool. France, XIII, p. 35, Pl. i, figs. 4–4*f*.

Localities.—Banana; July and August 1915; 68 ♂♂, 43 ♀♀ (11 ovig.), 3 young. St. Paul de Loanda; September 21 and 23, 1915; 1 ♂, 2 ♀♀, 14 young.

Range.—From Monrovia to Angola; (?) St. Thomas Island (Osorio).

Measurements.—Male from Banana: length of carapace, 34; greatest width, between tips of last teeth, 51.5; fronto-orbital width, 26.3; front between the antennæ, 13 mm.

Description.—Carapace well areolated, very coarsely granulated, bearing several raised lines composed of a single row of granules; one at the widest part of the mesogastric region, and widely interrupted at the middle; one long and two short lines on each protogastric region; one on each epigastric region; one hepatic, which may be curved or broken; one branchial, opposite the last tooth; one leading obliquely backward from the tip of that tooth. Each lobe of the front is divided into two, the small outer lobe being subrectangular but well marked. The middle, supraorbital lobe is separately arcuate; the inner suborbital lobe is conical, spiniform; the adjacent lobe is broad and subdivided into two shallow, rounded lobules, the outer of which is more advanced than the inner. Of the five anterolateral teeth, the first, forming the outer angle of the orbit, is partially fused with the second; the first is the smallest, its free part is triangular; the second has a strongly convex outer margin; the third is larger than the second and similar; the fourth and fifth are narrow-triangular, with nearly straight outer margin directed forward and outward, to a sharp and slightly curved tip. There is a stout, subhepatic tubercle below the second tooth, invisible from above.

The chelipeds are unequal, and the larger may be right or left. The carpus is rough with reticulated granules and a few low tubercles and irregular rugæ; it has a shallow groove and bears a stout, blunt tooth at the inner angle. The palms are smoother, their upper surface flattened and somewhat bimarginate, the fingers grooved, immovable one bent down, the light brown color running back a little on the palm but not reaching the tips, prehensile edges bearing low, triangular teeth, with a large, oblong, backward-pointing tooth at the base of the dactylus of the larger chela; the fingers of that chela sometimes, but not always, gape narrowly.

The sternum of the male is coarsely granulate, except on the posterior end and on the furrow in front of the abdomen. The third segment of the abdomen is in contact with the coxa of the posterior leg. A narrow piece of the sternum is exposed at either end of the second abdominal segment.

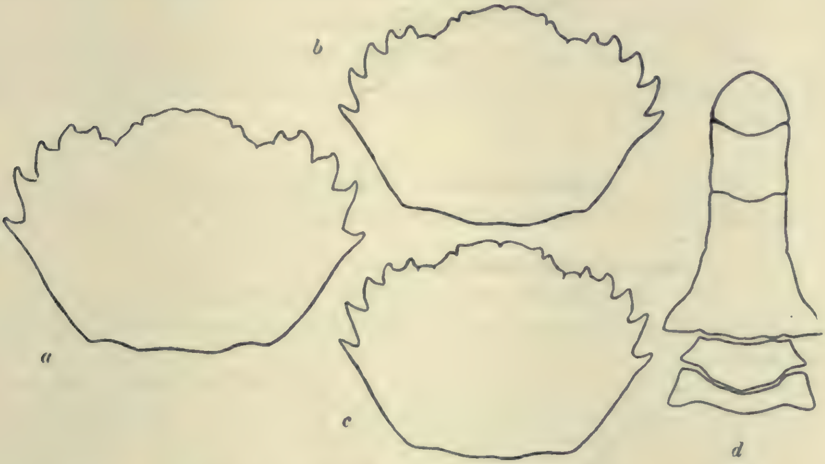


Fig. 19. *Panopeus africanus*, male, Banana.

A, carapace 51.4 mm. wide; *b*, carapace 34.2 mm. wide; *c*, carapace 33.7 mm. wide; *d*, abdomen of same specimen as *a*.

There is considerable variation in the shape of the lateral teeth of the carapace, especially the coalesced tooth; its sinus may be deep or shallow, the two parts of the tooth may be very unequal or nearly equal, and may be equally advanced, more often in large specimens, or their tips form a more or less oblique line.

"These large, tough-shelled, dark gray stone crabs with black and white-tipped claws are fairly common along the gently sloping shore of the bay east of Banana peninsula (Pl. LVI, fig. 1). Their favorite haunts are the quiet, highly brackish sites, sufficiently removed from the drift-line to be uncovered by the tide only a few hours a day. Sand or loosely heaped stones are avoided, their strong shears enabling them to burrow in firm ground strewn with rocks which the softly lapping waves keep partly imbedded. Here, just beneath the flatter stones, bricks, or similar, hard objects, a usually solitary crab digs out a short gallery, seldom more than ten inches long and wide enough to allow it to turn about easily. Away from the entrance is a deeper part where water remains even at low tide. It is here that the crab seeks refuge when the various stones are lifted, churning up the mud and hiding beneath it, or pressing itself against the sides of the hole.

"Very often one or more shrimps use this same burrow, but they fashion their own tunnels a little beyond or to the side. Apparently they only profit by the easy access to a welcome hiding place, the entrance to which is left open, except when incidentally covered by the action of the retreating water, and are not disturbed by the crab.

"At St. Paul de Loanda these crabs had established themselves in similar sites, but were also seen to hide in crevices in the old masonry of the harbor." (H. L.)

EURYPANOPEUS A. Milne Edwards

Eurypanopeus A. MILNE EDWARDS, 1880, Crust. Rég. Mex., p. 318.

Eurypanopeus blanchardi (A. Milne Edwards) ?

Plate XXXVI, Figures 2 and 3; Text Figure 20

Panopeus blanchardi A. MILNE EDWARDS, 1880, Crust. Rég. Mex., p. 323, west coast of Africa.

Eurypanopeus parvulus A. MILNE EDWARDS AND BOUVIER, 1900, Expéd. Sci. Travailleur et Talisman, 1880-1883, Crust. Déc., part 1, p. 99, not *Eurypanopeus parvulus* (Fabricius) or (A. Milne Edwards, 1880).

Locality.—San Antonio; August 1915; 1 ♂. "Pulled in with a seine from a depth probably not over 20 feet."

Range.—Cape Verde Islands, 10 to 30 meters, and Gaboon (A. Milne Edwards and Bouvier); San Antonio, Angola.

Measurements.—Male from San Antonio: length of carapace, 6.3; width, 9.3 mm.

Description.—This species has the anterior half of the carapace coarsely rugose; the anterolateral teeth little projecting but separated by deep grooves, the first and second teeth coalesced and separated by a shallow sinus; front beveled, the upper edge nearly transverse, as in Fig. 20*c*, but, viewed obliquely from above, the lower or true edge shows two lobes sloping backward to an outer rectangle (Fig. 20*b*).

The carpus of the unequal chelipeds is very rugose and lumpy and has a groove near and parallel to the articulation with the palm. The palms are also very rugose, especially in the upper and more proximal portions; the upper surface has two longitudinal ridges separated by a furrow, the inner ridge having a lobate prominence near the proximal end. The fingers are rather deeply grooved and the larger dactylus carries a large basal tooth.

I am unable positively to identify the San Antonio specimen with A. Milne Edwards's types, because the arrangement of crustaceans in the

Paris Museum was interrupted by removal during the war and has not yet been restored. I think, however, that this is with little doubt the species named *blanchardi*. Bouvier makes it a synonym of the American *parvulus* or *abbreviatus*. Our African specimen, however, differs from *abbreviatus* of equal size as follows. The carapace is slightly narrower in proportion to its length, but is wider in its posterior half, the posterolateral margins less convergent, so that the carapace appears less regularly oval than in *abbreviatus*. The anterolateral teeth are more pronounced and more elevated; the chelipeds more rugose, fingers more deeply grooved. A small piece of the sternum shows at each end of the second abdominal segment, between it and the coxa of the last leg; this is not the case in *abbreviatus*.

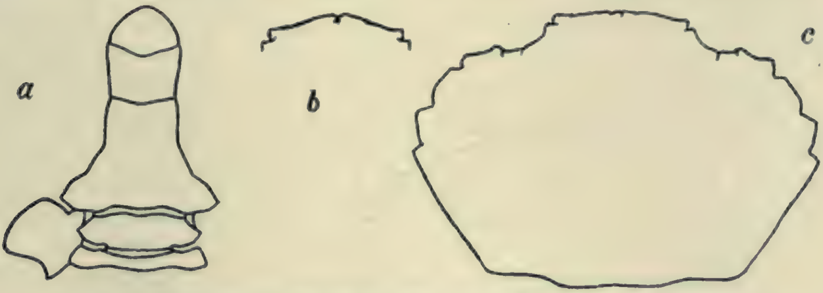


Fig. 20. *Eurypanopeus blanchardi* (?) male 9.3 mm. wide, San Antonio.
A, abdomen and coxa of posterior right leg; *b*, lower edge of front, viewed obliquely from above; *c*, outline of carapace.

Grapsidæ

Grapsinæ

Grapsus Lamarck

Grapsus Lamarck, 1801, Syst. Anim. sans Vert., p. 150.

Grapsus grapsus (Linnæus)

Plate XXXVIII

Cancer grapsus Linnæus, 1758, Syst. Nat., 10th Ed., I, p. 630.

Grapsus grapsus Ives, 1891, Proc. Acad. Nat. Sci. Philadelphia, p. 190. Rathbun, 1918, Bull. U. S. Nat. Mus., No. 97, p. 227, Pls. liii and liv, text-fig. 135, and synonymy.

Localities.—Banana; Moanda; July 1915; 10 ♂♂, 4 ♀♀ (3 ovig.).

Range.—Madeira; Canary Islands; Cape Verde Islands; Ascension Island; Senegal; Liberia; St. Thomas Island; Moanda; Banana; Angola. Also inhabits the tropical and subtropical shores of eastern and western America.

Diagnostic characters.—Front vertical. Tooth on carpus of cheliped ending in a short, spiniform tip.

The deflexed front of this species is very variable in its proportions. The front of the African specimens is high and narrow, resembling the form prevailing on the Pacific coast rather than that on the Atlantic coast of America.

"Its habits are marine, and its shell is so thin that one is surprised to find it at home in the most surf-beaten, rocky parts near Banana. Five miles north on the Atlantic shore, just at the foot of the lighthouse near Moanda, is a boulder field of laterite (Pl. LVII, fig. 2), a welcome interruption of the monotonous stretches of sandy beach. It naturally provides a real oasis for a multitude of rock-living, marine animals. Here, in the deep recesses and hollows of these rocks and beneath them, is the home of these crabs. Not only is it difficult to gather them from the crevices of the cutting, rough stones, but the crab when handled instantly sheds its big claws and legs. The best specimens secured were those injected with a solution of alcohol and formalin while in their very hiding places. Of course the rocks had to be first broken and forced apart to allow access.

"In the same place, but hiding among stones near the sandy shore and generally out of water, were a few specimens of *Geograpsus lividus*. At Banana only a single specimen of *Grapsus grapsus* was seen and taken from the loosely heaped stones (Pl. LVI, fig. 1) on the east side of the peninsula. At St. Paul de Loanda I saw many of these crabs on parts of the masonry in the harbor, and there they were gregarious." (H. L.)

GEOGRAPSUS Stimpson

Geograpsus Stimpson, 1858, Proc. Acad. Nat. Sci. Philadelphia, X, p. 101.

Geograpsus lividus (H. Milne Edwards)

Plates XV, Figure 1, XXII, Figures 2 and 3

Grapsus lividus H. Milne Edwards, 1837, Hist. Nat. Crust., II, p. 85.

Geograpsus lividus Stimpson, 1860, Ann. Lyc. Nat. Hist. New York, VII, p. 230. Rathbun, 1918, Bull. U. S. Nat. Mus., No. 97, p. 232, Pl. lv, and synonymy.

Locality.—Banana; July and August 1915; 6 ♂♂, 7 ♀♀ (4 ovig.).

Range.—Not before recorded from the African mainland. Cape Verde Islands; also Bermudas; from Florida Keys to São Paulo, Brazil; from Lower California to Chile; Hawaiian Islands.

Measurements.—Male from Banana: length of carapace, 34.2; width, 41.7 mm. The African specimens are considerably larger than any American ones examined.

Diagnostic characters.—Front little deflexed. Lateral margin well defined throughout its extent. Fingers pointed. Last three joints of legs bristly.

"The numerous stiff hairs on the limbs undoubtedly enable this crab to scurry in secure fashion over the slimy, smooth surfaces of the stones among which it lives. Usually during the morning hours, before the sun becomes hot, they can be observed feeding in the vicinity of their refuges. At the slightest disturbance they disappear into the crevices, where as many as a dozen may remain together. If further pursued they retreat into shallow, water-filled burrows established in the muddy soil beneath the stones. Their habitat on the edge of the shore-line is submerged for only a few hours every day. They were numerous on the east side of Banana peninsula in sheltered, rocky sites (Pl. LVI, fig. 1) with water of very slightly reduced salinity. Single specimens occurred on the western side hiding among the heaps of old iron wreckage, and a few in Moanda among the rocks at the foot of the lighthouse (Pl. LVII, fig. 2). Perhaps the constant rush of the waves of the Atlantic and the high salinity of the ocean deter them." (H. L.)

GONIOPSIS de Haan

Goniopsis DE HAAN, 1833, Fauna Japon., Crust., p. 5; 1835, p. 33.

Goniopsis cruentata (Latreille)

Plate XXXIX

Grapsus cruentatus LATREILLE, 1803, Hist. Nat. Crust., VI, p. 70.

Goniopsis cruentata RATHBUN, 1901, Bull. U. S. Fish Comm., for 1900, XX, part 2, p. 15, Pl. I (colored); 1918, Bull. U. S. Nat. Mus., No. 97, p. 237, Pl. LVII, text-fig. 136, and synonymy.

Localities.—Moanda; July 1915; 6 ♂♂, 7 ♀♀; all the specimens are small except one ovigerous female. Banana; July and August 1915; 19 ♂♂, 15 ♀♀ (10 ovig.), 6 young. San Antonio; August 1915; 1 ♂.

Range.—From Dakar, Senegal, to Lobito, Angola. Also at the Bermudas and from the Bahamas to São Paulo, Brazil.

Color.—A very showy crab, distinguished by its colors; carapace brownish yellow or brick-red; legs red, with spots of a darker red, extremities yellow. Chelipeds red, except the palms, which are almost white, and the fingers, which are yellow.

"At first it is a surprise to see these crabs stolidly perched upon a branch, five feet or more above the maze of decayed vegetation and reeking mud in which hundreds of crab-holes, partly filled with stagnant water, are scattered among a mass of stilt-roots. On these slanting roots the crabs creep up and down in very deliberate fashion, often accelerating their climbing performance along the vertical stem. The larger trees, though having rougher bark, are not visited and only the smaller ones serve for these promenades. With the needle-sharp tips and strong bristles of their legs they gain an easy foothold and, though they feed on the ground, they also work their mouth-parts even when loitering among the leaves. An instinctive shyness makes them move so rapidly when approached that it was impossible to catch one on a branch. Instantly they let themselves drop, landing in the mud without ever injuring themselves or losing a leg, even when striking a log. They quickly seek protection among the roots or between any other objects offering shelter. Should they enter one of the many burrows of other crabs they soon reappear, usually without paying any attention to the cause of their speedy retreat.

"At Banana they were also common among the loosely heaped stones (Pl. LVI, fig. 1) along a part of the shore in the bay and merely used the interstices as refuges, climbing about in the same way as upon smaller mangrove trees and bushes.

"A number of young were found hiding below the bark of decayed branches and mangrove shoots, a great heap of which had been thrown into the bay, where, submerged at high tide, the woody portion had become paste-like; only the bark had preserved its former toughness. Adults were scarce in this place at that time (July).

"From the range given by Miss Rathbun it is apparent that *Goniopsis cruentata* is known from a great part of the tropical portion of the West African coast. Yet these crabs avoid the seashore, and on finding them in good numbers in mangrove swamps one might at first consider these their favorite habitat. However, they are not found in any of these swamps far inland for they remain near the mouth of rivers, where the salinity of the water is less than in the sea but still greater than about the creeks up-river where mangroves are still able to flourish. Furthermore, they appear to be equally at home among rocks in favorable sites." (H. L.)

PACHYGRAPSUS Randall

Pachygrapsus RANDALL, 1840, Journ. Acad. Nat. Sci. Philadelphia, VIII (1839), p. 137.

Pachygrapsus transversus (Gibbes)

Plate XL, Figures 2 and 3

Grapsus transversus GIBBES, 1850, Proc. Amer. Assoc. Adv. Sci., III, p. 181.

Pachygrapsus transversus GIBBES, 1850, Proc. Amer. Assoc. Adv. Sci., III, p. 182. RATHBUN, 1918, Bull. U. S. Nat. Mus., No. 97, p. 244, Pl. LXI, figs. 2 and 3, and synonymy.

Localities.—Banana; July and August 1915; 30 ♂♂, 19 ♀♀ (4 ovig.); "living among and underneath stones in the bay on the eastern side of Banana peninsula." St. Paul de Loanda; September 21 and 23, 1915; 1 ♂, 2 ♀♀.

Range.—Madeira; Cape Verde Islands; Banana, Belgian Congo; St. Paul de Loanda and Lobito, Angola. Also Bermudas; from the Bahamas to Rio de Janeiro; from California to Peru; Oriental Region.

Diagnostic characters.—A small species. Carapace with one lateral tooth, sides strongly convergent posteriorly, and slightly arched behind the tooth. Front a little more than half as wide as carapace, edge granulate and sinuous with three shallow sinuses, surface smooth, except a transverse granulate line on each of the two marginal lobes; middle pair of upper lobes of front prominent, outer pair oblique, flattened. Inner tooth of wrist blunt. Upper edge of movable finger nearly smooth. Inner surface of palm very finely and closely granulate, proximal half finely striate. Merus of last leg dentate at posterior distal end.

Pachygrapsus gracilis (Saussure)

Plate XL, Figure 1

Metopograpsus gracilis Saussure, 1858, Mém. Soc. Phys. Hist. Nat. Genève, XIV, p. 443 [27], Pl. II, fig. 15.

Pachygrapsus gracilis Stimpson, 1871, Ann. Lyc. Nat. Hist. New York, X, p. 113. Rathbun, 1918, Bull. U. S. Nat. Mus., No. 97, p. 249, Pl. LX, fig. 3, Pl. LXI, fig. 1.

Localities.—Banana; July-August 1915; 102 ♂♂, 113 ♀♀ (39 ovig.), 12 young. San Antonio; August 1915; 4 ♂♂, 1 ♀.

Range.—Not before recorded from Africa[1]; Bermudas; from the Bahamas and Florida to Rio Parahyba do Norte, Brazil.

Measurements.—Largest male (from Banana): length of carapace, 10.3; width at lateral tooth, 19.4; fronto-orbital width, 18.4 mm.

Diagnostic characters.—Similar to *P. transversus.* Differs as follows. Margin behind lateral tooth concave or nearly straight. Front nearly two-thirds as wide as carapace, edge convex, upper surface smooth, without granulated lines; upper lobes of front obsolescent, outer pair considerably wider than inner pair. Inner projection of wrist a sharp spine or tooth. Movable finger spinulous or tuberculate above. Inner surface of palm rough with tubercles or coarse granules; proximally striate.

"These tiny, big-clawed crabs were found only near highly brackish water in the bay on the eastern side of Banana peninsula (Pl. LVI, fig. 1). First they were taken among and beneath loose heaps of stone along the shore. Later, numbers of them were found concealed, together with mollusks, behind the boards of a dilapidated landing place, just below the high-tide mark. Here, too, some had sought refuge in the cracks in the masonry, and others frequented the heaps of débris along the drift-line or those washed up among mangrove roots. In all cases darkness is an important requisite in their shelter. Driven out, they proceed rapidly and even the blazing sun does not prevent them from making a careful selection of their new retreats. The indistinct shades of brown on the upper side of the carapace match their hiding places well." (H. L.)

---

[1] Doflein, 1904, Brachyura 'Valdivia' 1898–1899, VI, p. 129, records *P. simplex* (Herklots) from Banana; but Herklots' *simplex*, according to de Man, 1900, is a synonym of *Goniopsis cruentata*.

Sesarminæ

SESARMA Say

Sesarma SAY, 1817, Journ. Acad. Nat. Sci. Philadelphia, I, p. 76.

"The five species of the genus *Sesarma* represented in the collection were found only in regularly inundated swamps of brackish water and none on the open Atlantic coast. The relatively great abundance of the different species in certain sites, as noted in the field, indicates that the amount of salinity of the water plays a more important rôle in their distribution than other conditions of environment. In the area we visited, they are naturally not restricted to the localities recorded, and it is probable that in other regions these crabs flourish in approximately similar habitats. *S.* (*Chiromantes*) *africanum* favored the more strongly saline bays or marshes near the seashore; *S.* (*C.*) *alberti*, *S.* (*Holometopus*) *büttikoferi* and *S.* (*H.*) *elegans* were plentiful in the Congo estuary from about 5 to 15 miles up-river to the regions about Malela; and *S.* (*H.*) *angolense* was common about 30 miles up-stream from Banana, where the salinity of the water is so slight as to be hardly noticeable to the taste.

"The most striking characteristic of their behavior is the persistent back-and-forth motion of the arm of the big claw (merus of cheliped) across the finely reticulated and granular portions of the side-front of the carapace. To all appearances this is an important function, serving as a milling process to disintegrate particles of food. My native helpers soon called all the members of this genus 'milling crabs,' being reminded of the way native women grind flour between two stones, an equally monotonous performance. As an incidental result of this grinding action the different species produce a more or less loud noise. The sharp, nipper-like tips of their fingers aid them in feeding and digging." (H. L.)

Subgenus **CHIROMANTES** Gistel

Chiromantes GISTEL, 1848, Natur. Thierreichs, p. x.

Carapace with at least one lateral tooth behind the outer orbital tooth. Manus with oblique, coarsely pectinated ridges on upper surface.

Sesarma (Chiromantes) africanum H. Milne Edwards

Plates XLI, XLII, Figure 2

Sesarma africana H. MILNE EDWARDS, 1837, Hist. Nat. Crust., II, p. 73.

Sesarma (Chiromantes) africanum RATHBUN, 1918, Bull. U. S. Nat. Mus., No. 97, p. 287, Pl. LXXV.

Localities.—Libreville, Gaboon; February 13, 1915; 1 ♂; J. P. Chapin, collector. Banana; July and August 1915; 35 ♂♂, 14 ♀♀ (1 ovig.), 6 young. San Antonio; August 1915; 7 ♂♂, 3 ♀♀ (1 ovig.).

Range.—From Senegal to Benguela, Angola; also Barbados.

Measurements.—Male from San Antonio: length of carapace, 39; width at anterolateral angles, 41.4; width at the next tooth, 43.8 mm.

Description.—A large, hairy species; the hair on the carapace coarse and arranged in horizontal lines. The four postfrontal lobes deeply separated; the middle pair wider than the outer pair. A small second tooth on the lateral margin. A very protuberant transverse ridge on inner surface of palm; upper surface crossed by four or more oblique granulated ridges, the most distal of which is the most longitudinal and most distinctly pectinated. The upper edge of the movable finger is crossed by about fifteen short, oblique, blunt, shallow ridges, each of which is crossed by fine impressed lines. On the inner surface and close up to the marginal striæ there are several irregular rows of horny-tipped granules. Color of chelæ in alcohol a light violet red. Propodites of first and second pairs of legs densely furry on the anterior or lower surface.

"Of the crabs of this genus represented in the collection, *S.* (*C.*) *africanum* occurs nearest the sea, as it prefers the most brackish water. On the Belgian side of the river the greatest colonies were found in the mangrove swamps along Banana Creek west of Nemlao and also in many suitable sites near Netona. On the Angolan side (Pl. LV, fig. 2), the direct flow of the fresh-water current of the Congo allows these crabs to go even closer to the Atlantic Ocean. After having observed their type of habitat in the mangrove swamps near Banana, I was rather surprised to see them in great numbers near San Antonio in a drained mangrove swamp which then more resembled a salt marsh. The surface layer of the ground had the consistency of moist soil, and here the crabs ventured outside their burrows only early or late in the day. Their galleries in such sites were a foot deep and did not intersect. Near Banana these crabs favored the dense, well-shaded mangrove swamps; the extremely soft, miry parts were more apt to be frequented by the young, which accommodated themselves among the rubbish and in shallow holes with which the earth was literally pitted; the adults, however, are excellent diggers and prefer the firmer ground.

"Though nearly as large as *S.* (*H.*) *angolense* and quite as gregarious, *S.* (*C.*) *africanum* attracts but little notice in dusky places, and in the more open sites remains hidden during most of the day. With the exception of the heavy claws, the reddish brown color of the upper side is often rendered inconspicuous by the particles of dirt that cling to the numerous, transverse patches of stiff hairs scattered over carapace and limbs. A remarkable feature is the fine, soft hair that covers the anterior lower portion of the legs like plush and forms a dense, long brush on the inner side above the sharp terminal tip. This allows the crabs to scurry about easily in the slush and slippery débris, and perhaps the brush is still more helpful in the evacuation of material as they excavate their burrows." (H. L.)

Sesarma (**Chiromantes**) **alberti,** new species

Plates XLII, Figure 1, XLVIII, Figure 3

Type locality.—Malela; July 8, 1915; 35 ♂♂, 25 ♀♀.

Holotype.—Male (Amer. Mus. Nat. Hist.).

Localities.—Malela; July 8, 1915; 35 ♂♂, 25 ♀♀, including type ♂. Banana; July and August 1915; 2 ♀♀ (1 ovig.), 4 young. San Antonio; August 1915; 2 ♂♂, 3 ♀♀ (1 ovig.), 2 young. In addition to these, which are from the American Museum Congo Collection I have seen from Rock Spring, Monrovia, 9 young specimens, taken along with *S. africanum* by O. F. Cook and G. N. Collins (Cat. No. 53641, U. S. Nat. Mus.).

Measurements.—Largest male, holotype: length of carapace, 30.4 ; width at the anterolateral angles, 33; width at next lateral tooth, 34.3 mm.

Description.—This species is associated with *S. africanum* and is so much like it that one may easily be mistaken for the other. The dorsal aspect of the carapace and legs is the same. The distinctive characters of *S. alberti* consist in (1) the milling on the upper edge of the movable finger, which is sharply cut, scarcely striated, the mills about thirty in number instead of fifteen, not bordered by granules on the inner surface of the finger; (2) the shorter and more swollen chelæ of the adult male, the lower margin of the propodus more convex, both fingers more curved; (3) the slightly different outline of the lower margin of the front, the two downward-projecting lobes being separated from the outer angles by an almost indistinguishable sinus, which is farther from the angles than is the well-marked sinus of adult *africanum;* (4) the color of the chelipeds is deep red in alcohol; (5) the heavy fur on the anterior surface of the propodus of the first two legs covers only the inferior half.

"From about 10 to 15 miles up Banana Creek to beyond Malela (Pls. LIX and LXII) and thence to Kunga lie the mangrove swamps which offer suitable environment to *S.* (*C.*) *alberti;* near San Antonio these crabs were taken in similar sites. Though sometimes associated with the larger *S.* (*C.*) *africanum*, they especially favor the more open stretches where dwarfed mangroves are widely scattered. As a rule, refuge is secured in holes close to the surface, but the single tunnel of some may be as much as six inches deep. Never as gregarious as the other related species in their favored haunts, they were most numerous along shallow channels into which small streamlets still meander at low tide, although they may be found singly even where *Potamides* shells abound, sites usually avoided by crabs.

"The reddish brown of the upper side is often rather dusky, the transverse patches of fine hair on the carapace, strongly pronounced in *S.* (*C.*) *africanum*, are rudimentary, and the soft-haired pads and stiffer hair on the legs slightly developed, but the curved finger-tips (dactylus) are very sharp." (H. L.)

Subgenus **HOLOMETOPUS** H. Milne Edwards

Holometopus H. MILNE EDWARDS, 1853, Ann. Sci. Nat., Zool., (3) XX, p. 187 [153].

Carapace without a lateral tooth behind the outer orbital tooth. Manus without oblique, coarsely pectinated ridges on upper surface.

Sesarma (**Holometopus**) **büttikoferi** de Man

Plate XLVII, Figures 5 to 9

Sesarma büttikoferi DE MAN, 1883, Notes Leyden Mus., V, p. 163; 1891, idem, XIII, p. 50. AURIVILLIUS, 1898, K. Svenska Vet.-Akad. Handlingar, XXIV, Afd. IV, No. 1, p. 11, Pl. III, figs. 1–4.

Sesarma (*Parasesarma*) *büttikoferi* RATHBUN, 1900, Proc. U. S. Nat. Mus., XXII, p. 280.

Sesarma (*Holometopus*) *büttikoferi* TESCH, 1916, Zool. Med. Mus. Leiden, III, p. 140, and synonymy.

Localities.—Katala near Zambi; July 4, 1915; 3 young. Malela: July 8, 1915, 100 (+) ♂♂, 70 (+) ♀♀ (5 ovig.); July 9, 1915, 37 ♂♂, 40 ♀♀, 1 young. Banana; July and August 1915; 4 ♂♂, 4 ♀♀ (1 ovig.). San Antonio; August 1915; 1 ♂, 1 ♀.

Range.—From Liberia to San Antonio, Angola.

Measurements.—Male from Banana: length of carapace, 10.4; width at post-orbital angles, 12.6 mm.

Description.—Carapace widest at anterolateral angles, smooth or non-granulate in the middle. Front vertical, concave, lower edge projecting, surface highest in the middle half.

Propodus of cheliped produced proximally beyond the carpus; outer surface very flat, punctate; almost smooth; upper surface at right angles to outer, with a few granules and oblique striæ, scarcely pectinate.

In alcohol, the hand is slate-color, the fingers orange-red.

In females and young specimens the propodus of the cheliped is not produced beyond the carpus; in consequence, the young (less than 10 mm. in width) are easily confused with the following species, *S. angolense*, with which it is associated. They may be easily detected by the different surface of the carapace, the upper surface of the fingers, and the persistent reddish color of the tips of the fingers in *büttikoferi*.

"These small mud crabs, named after Dr. Büttikofer, the well-known Director of the Zoological Garden at Rotterdam, who discovered them in Liberia, were common in the Congo only about Malela (Pls.

LVIII, LIX, and LXII). There the salinity of the water apparently offers the most suitable habitat. At Zambi none were found; the records farthest up-river are represented by three young picked up on a mud flat near Katala, where they had probably been stranded by the incoming tide. In Banana also their occurrence appears to be incidental and those from San Antonio were taken from the borders of a creek a few miles southward.

"So well do the dark grayish brown tones on the upper side match the favorite environment that, when not moving, these crabs might be overlooked. The big shears, though relatively small compared with those of other crabs, are considerably larger and more specialized in form in the male than in the female. Those of the former are curiously flattened in front and slightly turned forward near the 'elbow.' In life this smooth-looking surface is a color-bearing shield of conspicuous, enamel-like, purplish blue, set forth still more by the red of the pinchers. Usually this shield is invisible, for it lies against the ground, but the males have a habit of flashing upward at intervals one of these colored escutcheons. This is not in itself a remarkable performance amongst crabs, for many of them often lift one of their shears seemingly in defense against their neighbors, and fiddler crabs may do this for hours. But these tiny mud crabs, otherwise so deliberate in their ways, by the occasional display of the highly colored portion of the claws, remind one of certain butterflies which are inconspicuous as they sit in the sun until they spread their wings and reveal the beauty of their pattern. Such 'showing off' by the males is often supposed to attract the attention of the females. The latter in this species certainly can not vie with the male, for the patch on the claws of the female is small, slightly concave, and less highly colored.

"Their favorite sites are not the muddy mangrove swamps, but the well-shaded, adjoining portions farther inland. While daily inundations from the high tide last only a few hours, the steady decay of an abundance of drift material has formed a rich black humus. So numerous are the burrows here that one might at first considerably overestimate the numbers of crabs, which in these places are gregarious. Their tunnels are evidently deserted frequently, and the tides are so gradual as not to efface the old ones. Many of these refuges are shallow, six inches seeming to be a fair depth for the single gallery, which often passes along or near logs and roots. Some of the entrance holes are so wide that one expects to find a much larger crab. After the tide retreats, they usually sit or crawl about investigating the surface of the mud and flashing their 'colors.' Very often they are found singly near the shore below the drift, where they do not burrow, a fact indicating that they just happened to land there and are merely hiding from the sun." (H. L.)

Sesarma (Holometopus) angolense Brito Capello

Plates XLIII, XLV, Figure 1

Sesarma angolensis BRITO CAPELLO, 1864, Desc. tres esp. nov. Crust. Afr. Occ., Lisboa, p. 4, Pl. , fig. 2; reprinted, 1865, in Mem. Acad. R. Sci. Lisboa, Cl. Sci. Nat., Nova Ser., III, part 2.

Sesarma (Holometopus) angolensis DE MAN, 1900, Mém. Soc. Zool. France, XIII, p. 59, Pl. II, fig. 11. TESCH, 1916, Zool. Med. Mus. Leiden, III, p. 130, and synonymy.

Sesarma (Parasesarma) angolensis RATHBUN, 1900, Proc. U. S. Nat. Mus., XXII, p. 280.

Localities.—Zambi; June and July 1915; about 120 specimens, showing all sizes. Malela: July 4, 1915, 3 ♀♀ (1 ovig.), 1 young; July 8 and 9, 1915, 32 specimens, of which all but 2 ♂♂ are small.

Range.—From Liberia to Angola. Ponta da Lenha (Studer).

Measurements.—Largest male (from Zambi): length of carapace, 37.7; width at outer orbital angles, 43.7; greatest width, 44; width across top of front, 28.3 mm.

Description.—Carapace rough with small, scabrous and partly confluent granules; lateral regions crossed with a few oblique ridges. Carapace distinctly wider anteriorly than posteriorly. Upper edge of front marked by a single, nearly transverse row of granules; lower edge convex, projecting, wider than upper edge, outer angles rounded.

Chelæ very high, granulate; upper margin a granulate line, with several oblique ridges of granules just within; fingers flattened, narrowly gaping distally, immovable finger broad triangular. Inner surface of palm coarsely granulate on the swollen portion.

Legs broad; lower edge of propodus and both edges of dactylus thorny; last three segments long-hairy.

"Passing down-stream in a canoe from Boma, I was surprised to see near Zambi numbers of these crabs along the shore. At our approach they took refuge in their burrows in the soil or beneath stones or let themselves drop into the water. Large colonies on the nearby islands were the first to show the gregariousness typical of crabs in the neighborhood of the sea. Yet we were still about 30 miles from the mouth of the river and the salinity of the water was so slight as not to be readily perceptible to the taste, though the tide during the dry season (June to August) is so strong near Zambi that it may raise the water-level about three feet. This, too, is the section of the river where the large *Neritina* shells are found clinging to rocks and floating logs.

"Wherever the water is distinctly saline one need not look for *S.* (*Holometopus*) *angolense*, which is replaced farther down-river by *S.* (*H.*)

büttikoferi, *S.* (*H.*) *elegans*, and *S.* (*Chiromantes*) *alberti*. The young of *S.* (*H.*) *angolense*, however, assemble in great numbers beneath washed-up heaps of decomposed vegetable matter, which is lifted and moved by the high tides, so that many of them are liable to be stranded far from their homes. The adults are rarely distributed in this manner, as our collecting showed.

"Their most favored haunts were the low-lying, regularly inundated portions of swamps of papyrus and other reeds along the banks of the Congo and near the edge of neighboring islands. Especially numerous were these crabs on Bird, Hippopotamus, and Bulikoko islands, nearer the Angolan shore, opposite Zambi and east of Ponta da Lenha, though there were none in the mangrove swamps about Malela, but a few miles northeast.

"The reddish brown shade of the upper surface is often considerably dulled by particles of dirt clinging chiefly to the lateral ridges of the carapace. The external edge of the legs has a narrow, velvety pad and many long, soft bristles, an arrangement which may prevent slipping on steeper surfaces or in soft mire. The inner side of the leg is even better adapted to environmental conditions; the velvety pad, so strongly developed in *S.* (*C.*) *africanum*, in this species is only rudimentary, but instead the scattered, short, spiny bristles must certainly be of great assistance in climbing about the slippery stalks.

"As with other diurnal crabs, the early morning hours are the most favorable for observation. Most of them are then engaged in feeding from the miry mass into which they soon transform the puddles left among the tussocks by the retreating tide. Here dozens of them scurry about, many steadily rasping their arms along the milling plates and making a noise resembling that produced when walnut shells are slowly rubbed against each other.

"They are apparently not very shy, for the proximity of their burrows in the completely undermined tussocks offers such instant and secure refuge that in a moment they can find ample protection. Probably the burrows are not individually owned, for too many of them intersect. Some galleries lead to the tops of the hillocks and a few establish underground connections with neighboring colonies; the crabs usually remain in the part near the lowest level of the water. On pulling up one of these honeycombed bunches (Pl. LXI), there is a rapid exodus of crabs into the nearest tunnels. These crabs are not eaten by the natives, but I was told that at times large numbers are crushed and used as bait in certain types of fish traps." (H. L.)

Sesarma (Holometopus) elegans Herklots

Plates XLIV, XLV, Figure 2

Sesarma elegans HERKLOTS, 1851, Addit. Faun. Carcin. Afr. Occ., p. 10, Pl. I, fig. 10. NOBILI, 1906, Mem. Soc. Esp. Hist. Nat., I, p. 314, Pl. VIII, figs. 2–2*b*.

Sesarma (*Holometopus*) *elegans* RATHBUN, 1900, Proc. U. S. Nat. Mus., XXII, p. 280. TESCH, 1916, Zool. Med. Mus. Leiden, III, p. 148, and synonymy.

Localities.—Moanda; July 1915; 1 ♂, 2 ♀♀. Banana; July and August 1915; 93 ♂♂, 110 ♀♀ (10 ovig.). San Antonio; August 1915; 2 ♂♂, 1 ♀.

Range.—From Boutry, Guinea, to San Antonio, Angola.

Measurements.—Male from Banana: length of carapace, 18.8; width at postorbital angles, 18 mm.

Description.—Posterior margin of carapace short and posterolateral regions bent strongly downward, so that the carapace appears narrower behind than it really is. Lateral margins for the most part convex, and carapace usually widest behind the postorbital angles. Anterior half of carapace rough with granules arranged in twos or threes or even singly. Front subvertical; lower edge sinuous and advanced; superior lobes oblique, seen from above, those of the outer pair with a secondary and horizontal lobe behind them.

The palms of the male are much swollen and rough, the fingers irregularly toothed and gaping. On the upper margin of the merus of the legs there is a sharp terminal as well as subterminal tooth; last three joints very slender, the propodus very long, the dactylus very short.

"This small, tender-shelled, and agile crab had its habitat in the strongly brackish environment of mangrove swamps (Pl. LVIII). As our canoe glided along their edges in Banana Creek, one heard from time to time a noise like small pebbles being dropped into the water, mostly too late to see anything but ripples. At first I thought some of the commoner shells (*Littorina* or *Cuma*) were incidentally releasing their hold. But, on slowing down, the real cause was seen to be this crab. They were assembled in numbers upon the roots just above the water-level, as if driven up by the high tide.

"Their freckled, dirty greenish gray and yellow color so completely matched the surroundings, that they were easily overlooked. At the slightest alarm they let themselves drop, evidently trusting the water more than their spider-like dexterity to scurry out of sight. From their behavior I concluded that, in broad daylight, they were on the lookout for tiny morsels collecting about the mangrove bark with the receding tide.

"For a while I had given up hope of ever securing a good series of specimens until I happened to discover their place of refuge. At low tide, in particularly dense and well-shaded tangles of prop-roots, the soft mire fairly teemed with these crabs, and now our former attempts to catch them on the run or to fish them out of the water seemed ludicrous. We found it best to let them hide in shallow burrows, under pieces of bark, or even beneath dead leaves where they could be readily caught." (H. L.)

SARMATIUM Dana

Sarmatium DANA, 1851, Amer. Journ. Sci., (2) XII, p. 288 [5].

Sarmatium curvatum (H. Milne Edwards)

Plates XVI, XLII, Figure 3, XLVI, XLVII, Figure 1

Sesarma curvata H. MILNE EDWARDS, 1837, Hist. Nat. Crust., II, p. 75.
Sarmatium curvatum KINGSLEY, 1880, Proc. Acad. Nat. Sci. Philadelphia, p. 212.
TESCH, 1916, Zool. Med. Mus. Leiden, III, p. 215, and synonymy.

Localities.—Malela: July 4, 1915, 1 ♀; July 8, 1915, 22 ♂♂, 16 ♀♀ of assorted sizes, 14 very young. Moanda; July 1915; 2 small ♂♂. Banana; July and August 1915; 10 ♂♂, 8 ♀♀, 1 young. San Antonio; August 1915; 8 ♂♂, 4 young.

Range.—From Senegal to Lobito, Angola. Also at Martinique, West Indies.

Measurements.—Male, San Antonio: length of carapace, 28.7; greatest width, 36; fronto-orbital width, 28 mm.

Description.—Carapace convex in an anteroposterior direction, closely punctate, four or five oblique striæ on the posterolateral regions. The superior frontal lobes are smoothly rounded, the two middle ones much wider and better marked than the outer ones; middle of free edge of front concave as seen from above, straight as seen from before. Anterolateral margins arched, elevated and tridentate.

Chelipeds of male stout. Upper margin with a tuberculated edge for its proximal two-thirds; parallel to it but at considerable distance farther down on the outer surface, there is a granulated ridge from the carpus to the base of the movable finger, somewhat curved inward in its distal fourth; here, for sometimes half its length, it is modified into a pectinated crest with erect horny teeth. The upper margin of the movable finger is granulate near the palm, for the rest it is marked by a row of from twelve to fifteen short, low, oblique ridges,[1] directed forward, each having a few cross furrows or crenulations; just outside this row the border is transversely milled.

"The bright navy blue of a new carapace makes this crab for some time the most brilliantly colored among its kind in these regions. Later, however, in the subdued light of the mangrove swamps (Pls. LVIII, LIX, and LXII), the dusky violet of the well-hardened shell is less conspicuous against the irregular, muddy ground. It is undoubtedly not only the most typical of mangrove crabs, but strictly fossorial and gregarious in habits. A very hard, resistant shell, stocky build, and especially powerful hands stamp it as a first class earthworker, which no doubt provides retreats for many of its relatives in any kind of moist ground. It surpasses most other crabs in this ability to burrow through various mediums, though it avoids the open seashore, and stony and sandy ground. Noteworthy is the fact that in the ensuing labyrinths the principal channels, like those dug by *Cardisoma armatum*, always extend down to the water-bearing stratum, generally a few inches deeper than the level of the lowest tide. In the dry season in certain swamps, and at low tide near the shore, they reach a depth of nearly six feet.

---

[1] Tesch, *op. cit.*, p. 216, describes these ridges as "low spines" in the type specimens of *S. violacea* Herklots, a synonym of *curvatum*, but Herklots himself calls them "plicas. . . obliquas," a statement borne out by his figure (Addit. Faun. Carcin. Afr. Occ., 1851, p. 10, Pl. I, fig. 9).

"Surprising are its colonies in the tough, peatlike masses bordering some of the upper reaches of Banana Creek (Pl. XVI, fig. 2). There mangroves have succeeded in establishing themselves over former sand flats by an abundant formation of minute rootlets which secure as perfect an anchorage as their stilt-roots usually do in mud. This peculiarity of mangroves is apparently not recorded, yet the peaty mass they form is often several feet thick and completely honeycombed by burrows of various creatures. Here the largest holes are made by this beautiful crab, where its colonies predominate, while in typically muddy mangrove swamps a number of other species are found. *Sarmatium curvatum* is bound to brackish water and its distribution in the Congo estuary coincides with that of the mangroves shown on the map (p. 388)." (H. L.)

Cyclograpsus H. Milne Edwards

Cyclograpsus H. MILNE EDWARDS, 1837, Hist. Nat. Crust., II, p. 77.

Cyclograpsus occidentalis A. Milne Edwards

Plate XLVII, Figures 2 to 4

Cyclograpsus occidentalis A. MILNE EDWARDS, 1878, Bull. Soc. Philom. Paris, (7) II, p. 228. DE MAN, 1900, Mém. Soc. Zool. France, p. 57. A. MILNE EDWARDS AND BOUVIER, 1900, Expéd. Sci. Travailleur et Talisman, 1880-1883, Crust. Déc., part 1, p. 111, Pl. XVIII, figs. 1-5.

Localities.—Banana: July 1915, 12 ♂♂, 8 ♀♀ (4 ovig.); August 1915, 23 ♂♂, 13 ♀♀ (7 ovig.).

Range.—Cape Verde Islands, 10 to 30 meters; mouth of the Congo; Lobito, Angola.

Measurements.—Male from Banana: length of carapace, 11.7; greatest width, 15; fronto-orbital width, 10 mm.

Description.—The carapace is almost as wide at the level of the second ambulatory as it is a little in front of the chelipeds. Lateral border marked by a raised, granulate rim. Dorsal surface smooth and punctate in the middle but finely granulate along the frontal and lateral regions, especially in the corners of the carapace. Groove between cardiac and gastric regions well marked; the outer portions of the cervical suture are very faint. Front strongly deflexed, edge almost straight. Below the orbit there is a smooth ridge which breaks up outwardly into two elongate tubercles.

The chelipeds are granulate along the marginal ridges of the merus, along the prominent inner border of the carpus, and on the protuberant portion of the inner surface of the propodus; otherwise smooth. The gaping fingers have five or six prehensile teeth and end in a short, horny tip. The carpus of the ambulatory legs is almost as long as the propodus, which is largely covered with a short, dense velvet, and a few long, silky hairs; the dactylus is as long as the propodus and ends in a long, slender, yellow nail.

The first segment of the male abdomen is transversely ridged, the third to sixth segments inclusive appear distinctly separate but their articulations are a little less flexible, as if partly fused.

These specimens have been compared directly with one of the *Talisman* specimens from La Praya.

"These small, rufous crabs were collected along the shore of only the highly brackish portion of the bay east of Banana peninsula and on the northwestern edge of Bulabemba Island. The vegetable débris along the drift-line, which also attracts tiny snails (*Melampus*), furnishes their most favored shelter. But whereas the mollusks merely seek concealment therein, our crabs generally embed themselves in the sand or mud flush with the ground. Any suitable refuge beneath stones is equally acceptable, but they avoid extensive digging. The slight amount of excavating which they may do clearly marks their hiding place, as they burrow mostly after the tide has retreated. Their tendency to hide themselves during the day suggests nocturnal habits, but late in the afternoon I have repeatedly seen them scurrying about the sand and grass in the small, marshy belt, just at the time when the incoming tide was washing the drift back and forth." (H. L.)

CARDISOMA Latreille

Cardisoma LATREILLE, 1825, Encyc. Méth., Hist. Nat., Entom., X, p. 685.

Cardisoma armatum Herklots

Plates XVII, XLVIII, Figures 1 and 2, XLIX–LI; Text Figure 21

Cardisoma armatum HERKLOTS, 1851, Addit. Faun. Carcin. Afr. Occ., p. 7, Pl. I, figs. 4 and 5. RATHBUN, 1900, Proc. U. S. Nat. Mus., XXII, p. 277 (distribution; perhaps some of the localities belong to the real *guanhumi*). GRUVEL, 1912, Ann. Inst. Océanog., V, fasc. 1, pp. 3 and 4 (habits, and use as food).

Cardiosoma armatum NOBILI, 1906, Mem. Soc. Esp. Hist. Nat., I, p. 319, text-fig. 1.

Cardisoma guanhumi STIMPSON (not Latreille), 1907, Smithson. Misc. Coll., XLIX, p. 111.

Localities.—A large series, about 81 ♂♂ and 34 ♀♀, of fine specimens showing all ages was taken at Banana, July 1915. Moanda; July 1915; 4 small ♂♂. Malela; July 8, 1915; 1 small ♂.

Range.—Cape Verde Islands; from Senegal to Angola. Specimens are in the U. S. National Museum from Dakar, Senegal, and from Porto Praya, Cape Verde Islands, the latter identified as *C. guanhumi* by Dr. Stimpson. I have seen no specimens of the true *guanhumi* from West Africa.

Measurements.—Largest male (from Banana): length of carapace, 95; greatest width, 121; fronto-orbital width, 78.3; length of propodus of larger cheliped, 159; greatest height of same, 61.3; length of dactylus of same cheliped, 126 mm. Largest female (from Banana): length of carapace, 77; greatest width, 95.6; fronto-orbital width, 67.2; length of propodus of larger cheliped, 79.5; greatest height of same, 40.6 length of dactylus of same cheliped, 50.2 mm.

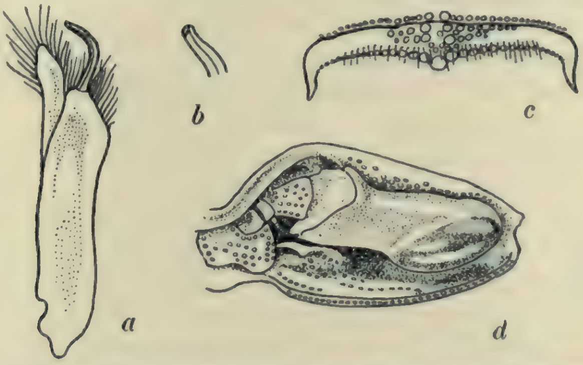


Fig. 21. *Cardisoma armatum*, male 94 mm. wide, Banana.

A, left appendage of first abdominal segment; *b*, tip of terminal spine of same; *c*, epistome, front view; *d*, eye in orbit, front view.

Description.—This species is closely related to *C. guanhumi*, the large land crab common throughout tropical America. The carapace is very convex fore and aft; the anterolateral marginal line begins at a small denticle behind the orbital tooth; sides of front oblique, the sinuous upper border of the orbit runs slightly backward to the outer tooth.

The inequality in the chelipeds increases with age, the large cheliped attaining enormous size in the old; the margins, especially of the merus, propodus, and dactylus, are armed with coarse tubercles or spines; these reach over on to the outer and inner surfaces of the chelæ, especially the inner surface of the large chela. The legs are furnished with long black bristles down to the proximal fourth of the dactylus.

C. armatum, although by some authors united with *C. guanhumi*, differs from it as follows.

(1) In the form of the appendages of the first segment of the abdomen of the male; in *guanhumi* the appendages terminate in two lobes

of nearly equal length; in *armatum* the two lobes are very unequal, the inner or more ventral one bearing a long curved spine which reaches distally as far as the outer or more dorsal lobe.

(2) In the sixth segment of the male abdomen, which is wider in proportion to its length in *armatum* than in *guanhumi;* of two specimens with the same sized carapace, this segment measures 24.5 mm. long and 22.3 wide in *armatum*, and 25.8 mm. long and 21.8 wide in *guanhumi*. In eleven other specimens of *armatum* in which the length of the sixth segment is between 18 and 25 mm., the length exceeds the width by from .5 to 1.7 mm. with one exception, 2.9 mm. In eleven specimens of *guanhumi*, the length exceeds the width by from 2.1 to 4.1 mm. This difference does not hold good for specimens under 60 mm. in width of carapace.

(3) In the tubercles and spinules arming the chelæ which are longer and stronger in *armatum* than in *guanhumi*.

(4) In the epistome whose lower border (edge of buccal cavity) is more strongly tuberculated in the African form.

Nobili (*op. cit.*, p. 319) suggests a possible difference in the form and dentation of the chelæ of *C. armatum* and *C. guanhumi*.

A comparison of males of large and medium size (70 mm. wide and upwards) with a series of about forty specimens of *C. guanhumi*, shows that the major chela is built on the same lines in the two species; it is normally much larger than the minor chela in medium-sized specimens, but there are occasional exceptions to this rule. In the old the fingers of the major chela become long and narrow and widely gaping. The only difference in outline in the two species which is worthy of mention is the greater development in *armatum* of the large tooth near the middle of the finger. In *guanhumi* the tooth at this point is usually small or absent in the old and is represented by several moderately enlarged teeth in the medium-sized. This rule has its exceptions. Several very large *armatum* chelæ have a large tooth on the lower finger only, while two *guanhumi* chelæ of similar size also have a large tooth on the lower finger. In medium-sized specimens a similar overlapping of characters occurs.

"These bulky crabs, by far the largest collected, generally avoid the seashore. At first it seemed very puzzling that these land crabs should be restricted to a narrow coastal border and the interior of the larger islands. An investigation of their burrows in various sites, however, clearly proved that they are dependent on moisture of the substratum. In every burrow at least one of the galleries extends down to the saline underground water, sometimes more than four feet below the surface. At Kunga I found young individuals having access to only fresh water in their temporary retreats about twenty feet up a slope near an extensive swamp. A little above the level of this underground water, they rest in a usually widened chamber. Their branchial apparatus requires suitably moist conditions and direct exposure to the rays of the sun is fatal to these crabs. When unearthing them, the presence of numerous, slightly tougher, smooth, old galleries proved that they often shift their resting places, evidently to adjust themselves to various water-levels, especially during the height of the dry season (July), when even larger lagoons dry up entirely. Under such circumstances some of these crabs are forced to undergo a period of estivation, during which the entrances to their burrows are obstructed from within. The sun-baked, fissured surface of the mud indicates that no burrowing is carried on during that time. Crabs established in more favorable sites (Pl. LIX), however, seem active throughout the year, though many of them do not leave their refuges for some time. The related *Cardisoma guanhumi* of tropical America and the Antilles frequently lives inland, far away from the seashore, to which it is said to repair during the breeding season. According to information kindly given me by the late Dr. Etienne, for many years a resident of Banana, such migrations were never observed for *Cardisoma armatum* at the mouth of the Congo, where these crabs never extend into the higher lying savannah country.

"In the neighborhood of villages the great numbers of these crabs render an efficient service by promptly disposing of all sorts of refuse. Like most scavengers they are nocturnal and travel sometimes for considerable distances, apparently guided by a keen sense of smell. In places sheltered from the sun an exceptionally satisfactory food supply may induce them to feast even during the day.

"Their large hands and powerful fingers are of great assistance in digging and pushing aside excavated material, as well as in the destruction of plants on the ground. I have never observed these crabs climb. They also use the hands as a means of defense and frequently fight among themselves; the natives credit the large, generally solitary males with driving other individuals from their burrows. In feeding, they use their smaller claw (cheliped) in the same manner as do fiddler crabs, which, moreover, very often contest their feasts, the two species maintaining the same relations as jackals and hyenas.

"The peculiar mounds of freshly excavated ground near or at some distance from the large entrances of their numerous burrows are the most conspicuous signs of the presence of these crabs, though wind and rain may rapidly efface them. Some of these burrows are very shallow and merely the temporary refuges of younger individuals, others are uninhabited. Those tunneled into firm soil, as at Kunga, and those several feet below hardened mud, as on Bulabemba Island, are undoubtedly made when moist conditions facilitate this process, as is the case with dusty or loose sand, which the crabs seem to moisten with fluid they carry around in their body. The sites they favor most are the level, sandy stretches beyond the drift-line, especially open spaces between boskets of *Phœnix* palms and other bushy vegetation, or the higher-lying slopes bordering mangrove swamps. Their burrows generally start obliquely downward and may then turn or branch in any direction. Usually one or two individuals may live together, and in large colonies the whole ground seems honeycombed by intersecting galleries. On Banana peninsula these crabs often invade the closed-in areas beneath white men's houses which have been elevated on iron pillars to be out of the reach of the equinoctial tides. Ordinarily, little attention is paid to their tunneling, but owners of vegetable gardens keep a sharp lookout for freshly raised mounds, since in spite of palisades driven deep into the ground these crabs often succeed in passing below, causing great destruction among the more tender plants.

"In open ground they are easily dug out, but to catch them in heavier vegetation large, empty kerosene cans are set flush into the ground. Into these they scamper without hesitation—completely helpless in their efforts to escape. Boys often succeed in capturing a few merely by teasing them inside their burrows with a flexible stick which the crabs grasp with their claws. Pulled out, they may often be carried for hours, stubbornly maintaining their firm grip. Others are caught in nooses set near the entrances to their burrows and very seldom free themselves by dropping their hand or even the single leg by which they are caught. In hard soil, hot lye of woodashes poured into their holes is said to be most effective in driving them out.

"At Banana Dr. J. Bequaert observed a curious case of phoresy, in which tiny ephydrid flies had themselves carried about by these crabs. Eleven such insects were taken from the body of a single specimen, over the carapace of which they were running to hide beneath the recurved abdomen. During the hours of sunshine some of these Diptera were seen to fly near the burrows of the crustaceans. It is not known for what purpose they are associated with the crabs.

"On the Belgian side of the estuary no one would think of using these crabs for food purposes, their scavenger habits evidently repelling the natives; but north and south of the Congo they seem to be eaten, and in some cases considered a relish.[1] According to the late Dr. Etienne of Banana the excellence of such a dish aroused general surprise at a dinner given by a visiting host.

"After becoming well acquainted with their general habits, I was rather interested in visiting 'a very large colony far inland,' as the natives expressed it. I was surprised when shown a colony several miles north of Banana, but only half a mile from the shore, in low, but savannah-like surroundings. A grove of *Phœnix* palms badly damaged by passing grass-fires (Pl. LVII, fig. 1) was their headquarters. The presence of the palms clearly indicated that not far below was a water-bearing stratum, though at that time the burned aspect of the vegetation imparted to the country more the appearance of a desert.

"In young individuals rather beautiful violaceous and red tones predominate on the carapace and hands, but in older ones dirty yellow with only slight reddish and bluish hues prevail." (H. L.)

Ocypodidæ

OCYPODE Fabricius

Ocypode FABRICIUS, 1798, Entom. Syst., Suppl., p. 312.

Ocypode ippeus Olivier

Plate LII

Ocypode ippeus OLIVIER, 1804, Voy. Empire Ottoman, IV, p 52; Atlas, part 2, Pl. XXX, fig. 1. RATHBUN, 1900, Proc. U. S. Nat. Mus., XXII, p. 275, and synonymy.

Localities.—Cape Lopez, French Congo; February 8, 1915; 1 small ♂; J. P. Chapin, collector. Moanda; July 1915; 5 ♂♂, 1 young. Banana; July and August 1915; 25 ♂♂, 18 ♀♀, and over 100 young ones. Banana; September 1915; 11 ♂♂, 3 ♀♀. San Antonio; August 1915; 3 ♂♂, 4 ♀♀.

Range.—Cape Verde Islands; from Cape Verde, Senegal, to Angola. Eastern and southern shores of the Mediterranean.

Measurements.—Male from Banana: length of carapace, 38.4; width at anterolateral angles, 45.7; greatest width near middle of carapace, 46.2 mm.

Description.—Carapace coarsely granulate; anterolateral angles forming a large lamellate tooth; lateral margins arcuate; front broadly spatulate. Eyestalks terminating in a brush of hairs about as long as the cornea.

Propodus of larger chela about as broad as its middle length; lower edge with prominent denticulation; stridulating ridge on inner surface finely milled with sixty or more striæ and bordered distally by a brush of short hair.

---

[1] Gruvel, 1912, Les Crustacés comestibles de la Côte occidentale d'Afrique, Ann. Inst. Océanog., V, fasc. 1, p. 4.

Merus of legs elongate, with nearly parallel sides; the propodus of the first two pairs is armed with several rows of short, sharp spines, longest on the lower or posterior border.

The sixth segment of the male abdomen is nearly as long on the median line as it is wide, and has converging lateral margins.

The young, down to a carapace length of 11.6 mm., have a brush of hairs at the end of the eye; smaller specimens show only a tubercle at that point.

Ocypode africana de Man

Plate LIII

Ocypode africana DE MAN, 1881, Notes Leyden Mus., III, p. 253. RATHBUN, 1900, Proc. U. S. Nat. Mus., XXII, p. 275, and synonymy.

Localities.—Moanda; July 1915; 4 young. Banana: July and August 1915, 35 ♂♂, 15 ♀♀ (2 ovig.); September 1915, 5 ♂♂, 1 ♀ ovig. San Antonio; August 1915; 1 ♂.

Range.—From Senegal to Muserra, Angola.

Measurements.—Male from Banana: length of carapace, 24; width at anterolateral angles, 27.9; greatest width, 29.4 mm.

Description.—Carapace covered with low granules; anterolateral angles inconspicuous, pointing forward; lateral margins angled, the anterior third of the two sides subparallel; front very little widened at the middle. Eyestalks without a terminal brush or style.

Propodus of larger chela distinctly broader than its middle length (at the articulation with the carpus); lower edge with shallow denticulations; stridulating ridge milled in its lower half, changing gradually to more distant tubercles in the upper half; the total number of ridges is less than half as many as in *O. ippeus*. Merus of first three pairs of legs dilated at the middle. The ornamentation of the legs consists of low denticulations and rugæ.

The sixth segment of the male abdomen is distinctly wider than long, its sides strongly arcuate.

"Very few of the other closely related species of crabs represented in the collection are so similar in behavior as the two of the genus *Ocypode*, clearly a result of the uniformity of their habitat. These handsome, partly diurnal crabs enliven the lone, sandy stretches along the Atlantic shore and are common between Banana and Moanda, but scarcer on the Angolan coast near San Antonio (Pl. LV, fig. 1). The ceaseless pounding of the waves and of the powerful breakers may have contributed much toward developing their speedy ways and quick reactions. Furthermore, the strong, battering surf, constantly bringing about shifting conditions, makes them more or less vagrant, for old quarters are torn away and new ones piled up. High up on the steeper portions of the beach which slope at an angle of at least thirty degrees, one may find their single burrows. These are widely distant from one another, and, with rare exceptions, each is owned by one individual.

"The great shyness of these sand crabs contrasts strangely with the relative tameness of mangrove crabs. In the dense tangles of roots and débris, the latter are generally so close to a dozen hiding places that they need not move far for safety, and can be observed at leisure only a few feet away. But at the very moment one hopes to grab them they dodge to cover. Sand crabs, however, living in open spaces and often loitering at some distance from their burrows, have an alertness that prompts them to race for shelter at the first sign of danger. As with a peacefully grazing herd of antelopes, when one takes to flight all the others follow suit. So, at the slightest alarm these crabs clear the field when the intruder is still a hundred feet or more from the nearest. It is amusing to see how rapidly they speed across the sand and with what unerring accuracy each individual locates its burrow even when a sudden squall has closed it and effaced every outward trace.

"So rapidly do these crabs dig that seldom can they be caught before disappearing into their subterranean home. This consists of a downward sloping tunnel, slightly wider than the carapace and usually not over eighteen inches deep. However dry and hot the sand may become on the surface, the lower half of the tunnel remains moist. Several of my first attempts to capture them in their burrows were in vain. Pursued closely, they sometimes concealed themselves in a short gallery leading upward at right angles to the main tube about ten inches from the entrance. At first thought, this offshoot seems evidently for escape from danger, but failure to discover any possible enemies on so bleak a coast raises doubt as to this. There are no other kinds of crabs to invade their burrows, and among themselves they fight but little. Only a few times did I see a crab follow another into a hole, one always immediately leaving. Nor are these crabs eaten by the natives, who, moreover, would not be deceived by such a device. This supplementary gallery, so far above the level of the ordinary resting place at the bottom of the tunnel, may have something to do with the necessary reënforcing of the main channel by supplying sand from above after the waves have swept over it. Then, too, it may be a temporary refuge when, at high tide, water fills the lower quarters, for they perish by drowning as surely as from insufficient moisture.

"The easiest way to catch these crabs is to scoop out a hole about a foot wide and two deep. In throwing out the sand, one never fails to unearth the crab, which for a moment at least may then assume a comatose state. Its revival, however, is so sudden and unexpected that it often makes good its escape while being picked up as half dead. When escaping, generally in zigzags, these crabs suddenly disappear into the loose, hot sand as by enchantment, but shortly emerge again, for they can not stand heat.

"Relatively long legs keep their light body well off the ground and the needle-sharp tips speed along without leaving a mark. With them they dig their burrows, the claws only assisting in carrying to the entrance some of the excavated material, much of which is forced against the sides of the tunnel to strengthen it. When deprived of their refuge, they dart about confusedly and may have a few skirmishes with their nearest neighbors, but generally disappear into the sea after running along the shore for a while. Those starting a new burrow reach a depth of about five inches in a quarter of an hour, but most of such beginnings are soon abandoned and only a few were found completed next day.

"A most curious display they offered when swept off unawares by a wave. Their first frantic struggles to retain hold on the sand were as amusing as their sudden doubling up when the full power of the water exerted itself on the downward sweep. But it was decidedly interesting to see how, at the very moment the wave had spent its force and the crabs could feel ground again, they immediately used all possible speed to keep ahead of the silver border of the new rush that might repeat the catastrophe.

"Both species show great alacrity in feeding, with a predilection for decaying animal and vegetable matter; under certain circumstances, especially at night, they may come in numbers to remains of fish, but they are not really gregarious and shift for themselves. As a rule *O. ippeus* is seen farther down the shore than *O. africana* and more often runs to the water's edge, preferring moister sites, and is less partial to sunshine.

"The cinnamon color of *O. ippeus* appears more yellowish and always lighter on bright days, but when the crabs are taken from their burrows it is considerably darker, as on rainy days or at night, evidently from the effect of the moisture. Some specimens even show a blotched appearance, but seldom with as distinct a reticulated, dark gray pattern as the young. The latter select shallow, sheltered places where twenty or more divert themselves at the edge of a cove, probably for feeding purposes. When approached, they usually dive beneath the sand, which is kept partly floating by the constant play of the waves; they seldom burrow and are rather apt to escape into the sea.

"*O. africana* loves the early morning hours. Then the pink of the finely granulated carapace is brightest, whereas late in the afternoon, when these crabs appear again, or during the rain, the color is indistinct, showing only a faint trace of their former beauty; then from a distance one often is not able to distinguish the two species. Their burrows are somewhat higher up the slopes than those of *O. ippeus*, and only a few feet below the uppermost drift-line, where the water seldom stays very long. Perhaps in their refuges they are less dependent on moisture than their close relatives. In the open they show a great preference for remaining near the streak of moist sand just above the surf-line, where countless tiny burrows of sand fleas (amphipods) give the surface a rough, pitted aspect." (H. L.)

UCA Leach

Uca LEACH, 1814, Edinburgh Encyc., VII, p. 430.

Uca tangeri (Eydoux)

Plates XLV, Figures 3 and 4, LIV

Gelasimus tangeri EYDOUX, 1835, Mag. de Zool., Cl. 7, Pl. XIV, colored.

Uca tangeri RATHBUN, 1900, Proc. U. S. Nat. Mus., XXII, p. 276; 1918, Bull. U. S. Nat. Mus., No. 97, p. 387, Pls. CXXXV and CXXXVI, and synonymy.

Localities.—Moanda; July 1915; 2 ♂♂, 2 ♀♀. Banana; July and August 1915; 67 ♂♂, 54 ♀♀ (2 ovig.), 4 young. San Antonio; August 1915; 2 ♂♂, 1 ♀.

Range.—From Portugal to northern and western coasts of Africa, as far as Algiers and Angola. Also reported from the West Indies and with doubt from Bahia.

Description.—Carapace much narrower posteriorly than anteriorly in the male, less so in the female; surface rough with irregular tubercles and granules; the front occupies about two-fifths of the anterior margin. The exposed surface of the large cheliped is coarsely tuberculate; there is a very strong, right-angled ridge within the palm; the very elongate fingers are thin, flat, closely granulate, the immovable finger is widest near the middle, dactylus more slender, gradually tapering to the tip.

"The fiddler crabs nearly always occur in numbers, are diurnal in habits, and naturally arouse considerable interest. On the upper parts two general tones prevail—dark reddish brown and yellow, with transitions between. The bigger shears of the male vary in practically the same manner; in some dusky blue is distinct. The tiny claws of the female are paler, even pink or cream. There is evidently but one species about Banana, though specimens of all colors and sizes and from every possible nearby locality are represented in the collection.

"They were common only in highly brackish water and avoided the open seashore. In the bay east of Banana peninsula they lived in numbers on smooth, sandy flats completely submerged at high tide. Some of the edges of mangrove swamps (Pls. LVI, fig. 2 and LX, fig. 2), both muddy and sandy, literally swarmed with them on either shore of the Congo; in San Antonio they also frequented sites resembling salt marshes.

"Shortly after the tide receded the sand was pushed up from below and pressed outside, mainly with the part of the big claw in front of the wrist by the males, and mostly with the carapace by the females. The amount of sand thus evacuated showed that only two or three inches of their burrows had been obstructed by the passing tide. The slightly slanting tunnel is somewhat wider than the carapace and in sandflats may be a foot deep; there are usually no side shoots, but in densely inhabited places they often intersect.

"When feeding, these crabs use their smaller claw, which supplies enough food to keep the mouth-parts steadily moving. Though attracted by decomposed vegetable and animal matter and even human feces, near Banana they practically 'grazed' on the hardly visible surface film left by the retreating tide upon sand and mud, consisting chiefly of tiny algæ and plankton.

"In one place hundreds of fiddler crabs used to convene regularly to go through their strange antics. One of their pastimes seems to be the moving of their big claws in a most monotonous fashion. On observing their often threatening gestures among themselves one feels that they would not mind other disturbance. Yet at the first sign of danger from without, harmony is restored, and all hurry towards numerous open holes, which great colonies have dug beneath and between protecting roots." (H. L.)

Superfamily **Oxyrhyncha**

Inachidæ

Pisa Leach

Pisa Leach, 1814, Edinburgh Encyc., VII, p. 431.

Pisa carinimana Miers

Plate XVIII, Figures 1 and 2; Text Figure 22

Pisa carinimana Miers, 1879, Ann. Mag. Nat. Hist., (5) IV, p. 11, Pl. iv, figs. 6, 6*a*, Canaries; 1881, Ann. Mag. Nat. Hist., (5) VIII, p. 207.

Localities.—San Antonio; August 1915; 1 young ♀. St. Paul de Loanda; September 23, 1915; 1 ♀ ovig.

Range.—Canary Islands (Miers); Gorée Bay, Senegambia, 9 to 15 fathoms (Miers); mouth of the Congo, 44 meters (Doflein); San Antonio and St. Paul de Loanda, Angola.

Measurements.—Female from St. Paul de Loanda: length of carapace on median line, 12.7; length to end of rostrum, 14.8; width, 11.5 mm.

Description.—A small species, with its carapace covered with a short pubescence and a few longer curled hairs. A spine at the posterolateral angle of the carapace, a shorter, branchial spine in the same transverse line and, in front of that, a low tubercle. A stout, oblong protuberance on the hepatic margin, and a few low tubercles on the gastric region. Cardiac region very convex, elevated and rounded. Rostrum divided for more than half its length, horns very divergent, slender, acuminate. Supraocular eave a broad, alate expansion; supraorbital tooth pointing outward and free on either side; postocular cup somewhat crescent-shaped in dorsal view, ovate in ventrolateral view. A row of tubercles on the pterygostomian and the subbranchial region.

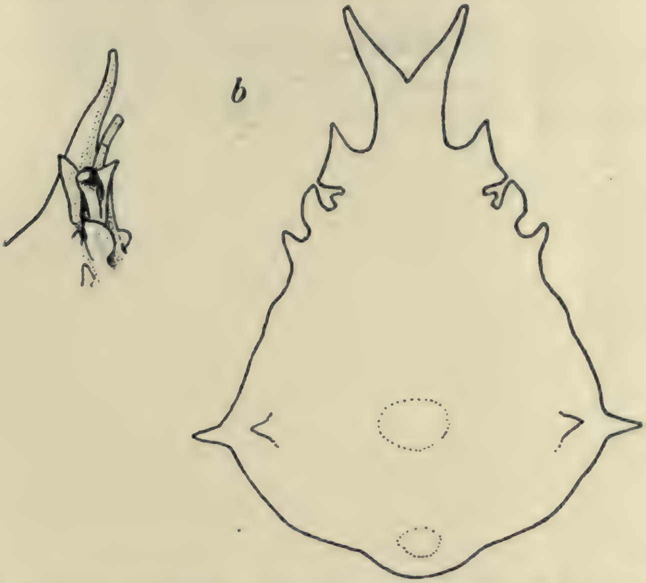


Fig. 22. *Pisa carinimana*, female, total length of carapace 14.8 mm.
A, side view of orbital region; b, carapace.

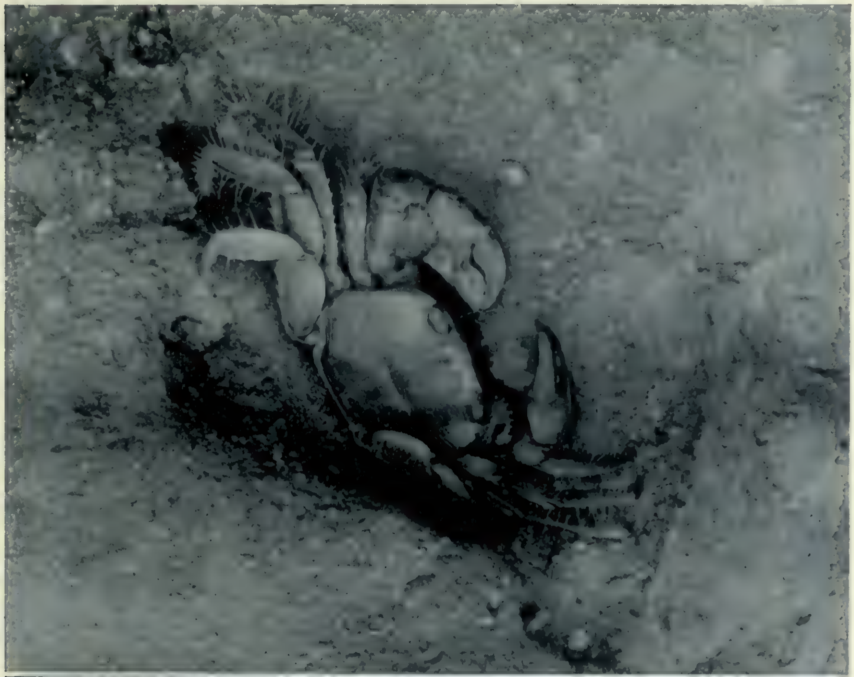
Chelipeds shorter than the first pair of legs, in the female slender, in the male stouter; wrist irregularly carinate. Last three pairs of legs short, diminishing in length to the posterior pair.

"When the equinoctial tides are at their lowest, the interesting marine fauna in the more shallow portions of the harbor of St. Paul de Loanda can be easily reached. Among the attractions are the fragile shells of *Pinna*, always associated with a firm cluster of other sea animals, chiefly ascidians and sponges, which completely surround the upper, outstanding portion of these huge shells. This mass is generally irregular and brownish, looking in all respects like many others on the bottom of the bay. As one inserts both hands below such lumps, one incidentally comes across those that hide the *Pinna*, which can then be slowly lifted from the sand with its large byssus still adhering. This proved a fruitful way to collect several species of mollusks and crustaceans, which are well concealed. In one such mass this crab was found, its carapace being completely covered by a sponge which rendered it invisible; it was taken at only four feet below the surface. The one from San Antonio was found among clusters of gigantic barnacles washed into a coral reef somewhat south of Padron Point." (H. L.)

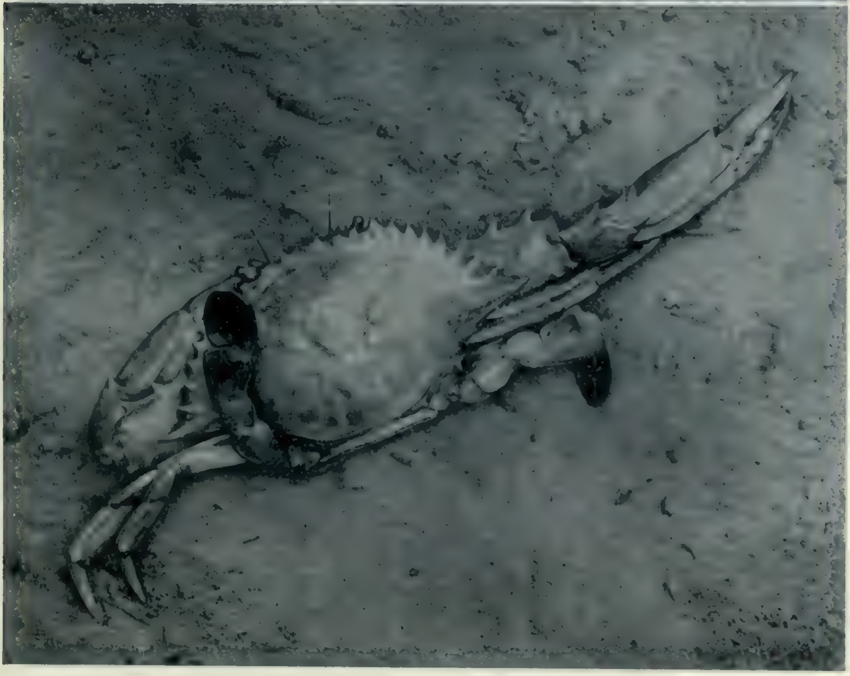
PLATE XV

Fig. 1. *Geograpsus lividus*, freshly killed specimen in characteristic habitat, Banana. Reduced.

Fig. 2. *Callinectes latimanus*, freshly killed specimen in characteristic attitude in shallow water, Banana. Reduced. See p. 398.



1



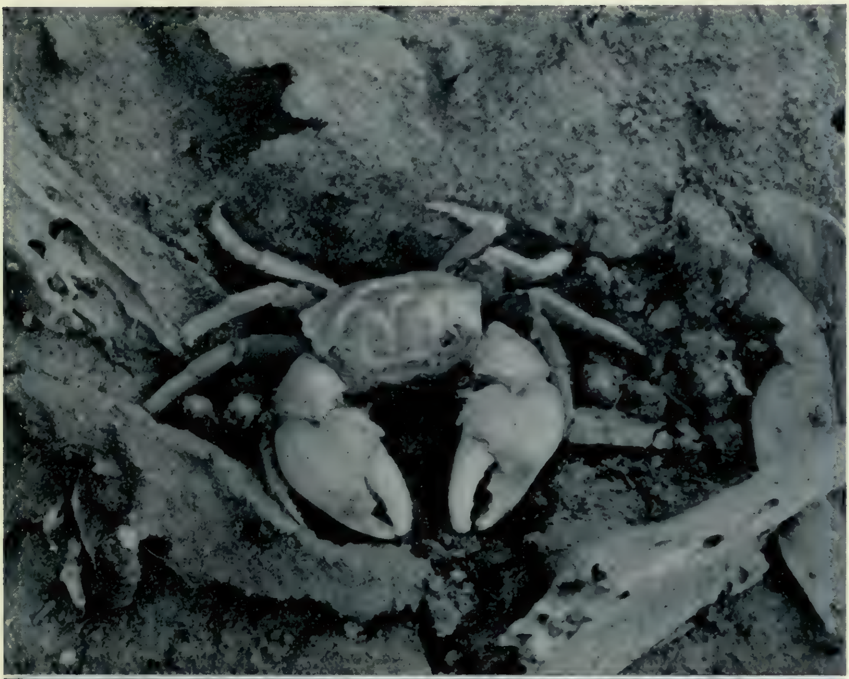
2

PLATE XVI

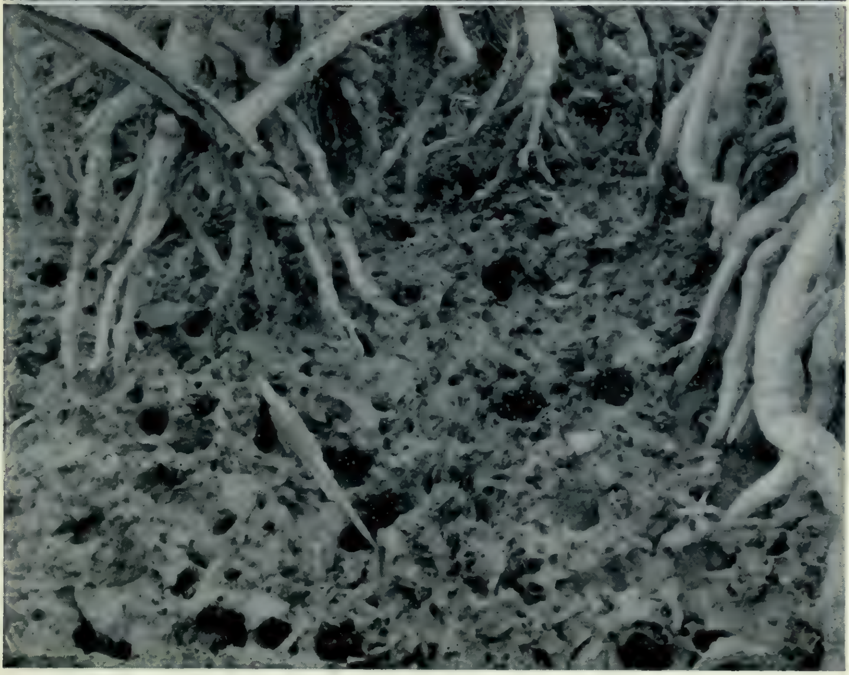
Fig. 1. *Sarmatium curvatum*, freshly killed specimen in characteristic habitat, Banana. Reduced.

Fig. 2. Habitat of *Sarmatium curvatum* near Banana. Reduced. See p. 454.

"A tough, peat-like mass of minute rootlets, often several feet in thickness, is formed by mangroves (*Rhizophora Mangle* Linnæus) in sandy places where anchorage can not be gained in any other way. The large holes are made chiefly by the beautiful blue crab (*Sarmatium curvatum*) and usually extend a few inches deeper than the level of the lowest tide. Here this is the most common crab, whereas in typical, muddy mangrove swamps several kinds are equally abundant; the smaller holes are the exits to long tunnels made by a whitish, thalassinid crustacean about an inch in length (*Upogebia furcata*). Young eels and a few other creatures also use the tunnels as refuges." (H. L.)



1



2

PLATE XVII

Fig. 1. View showing habitat of *Cardisoma armatum*, with crab near mouth of burrow, Banana. Much reduced.

Fig. 2. Detail of Fig. 1 on a larger scale.

1

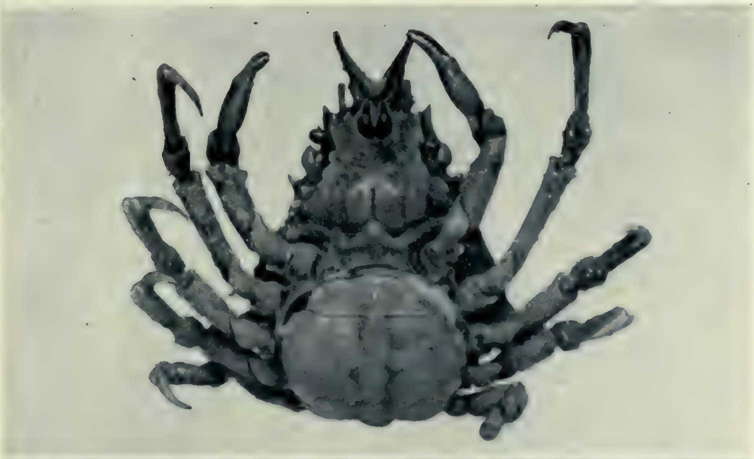
2

PLATE XVIII

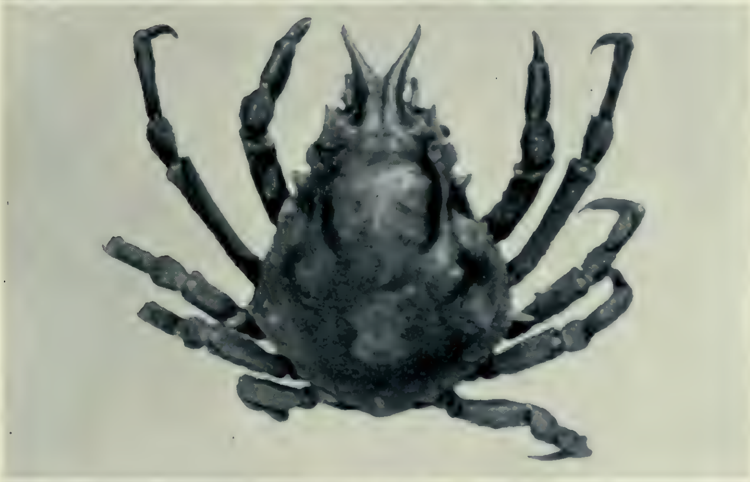
Fig. 1. *Pisa carinimana*, female, 14.8 mm. long, St. Paul de Loanda, ventral view.

Fig. 2. Same, dorsal view.

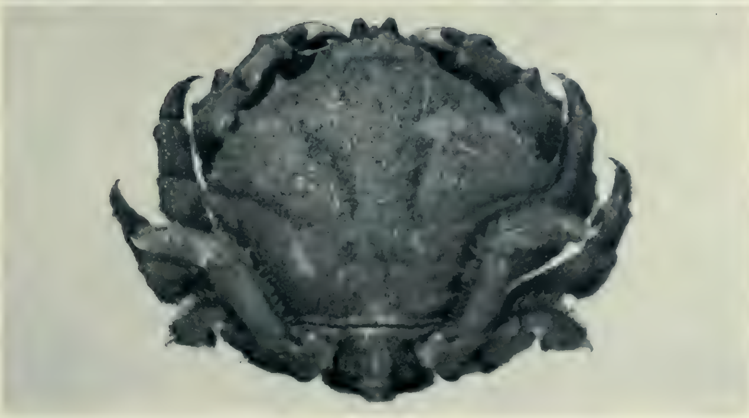
Fig. 3. *Dromia atlantica*, female, 30 mm. wide, St. Paul de Loanda, dorsal view.



1



2

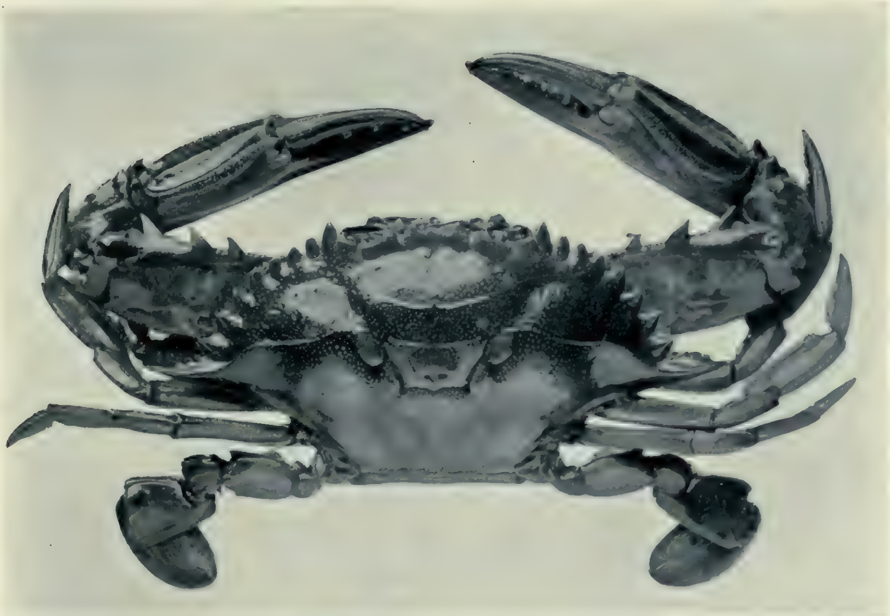


3

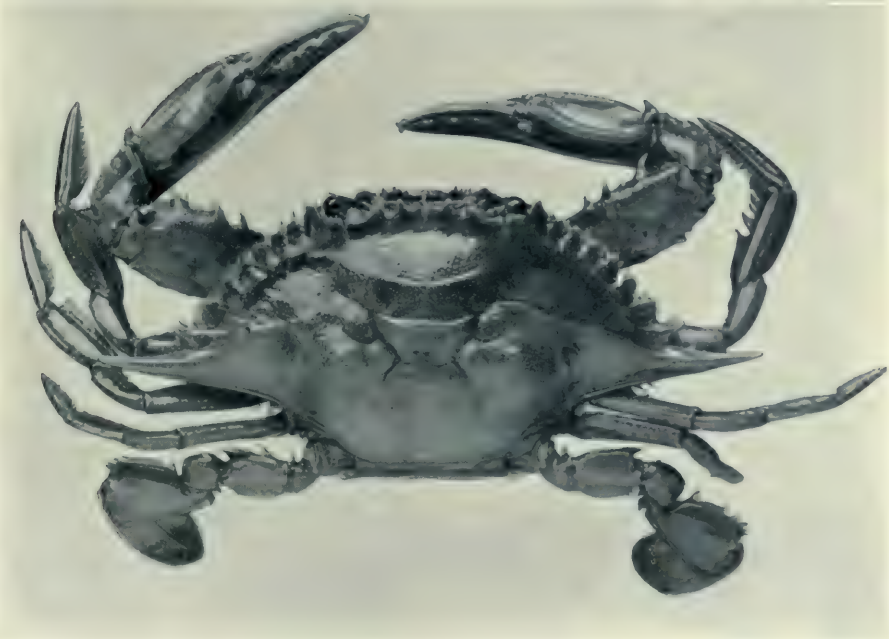
Plate XIX

Fig. 1. *Callinectes marginatus*, male, 101 mm. wide, Banana, dorsal view.

Fig. 2. *Callinectes gladiator*, male, 78.7 mm. wide, San Antonio, dorsal view.



1

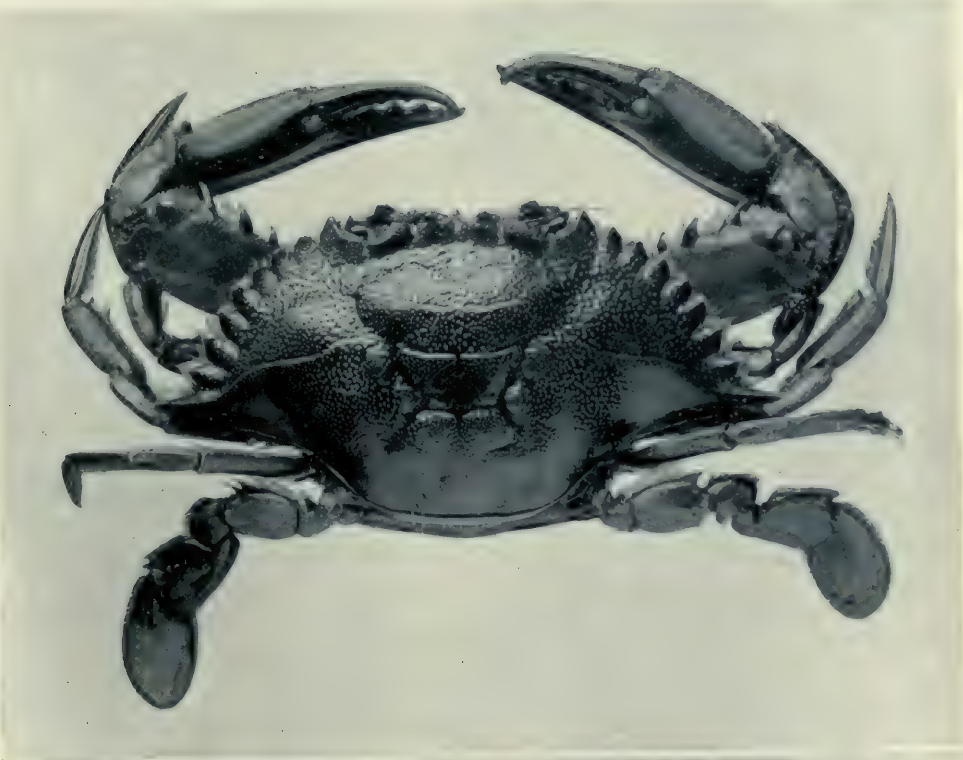


2

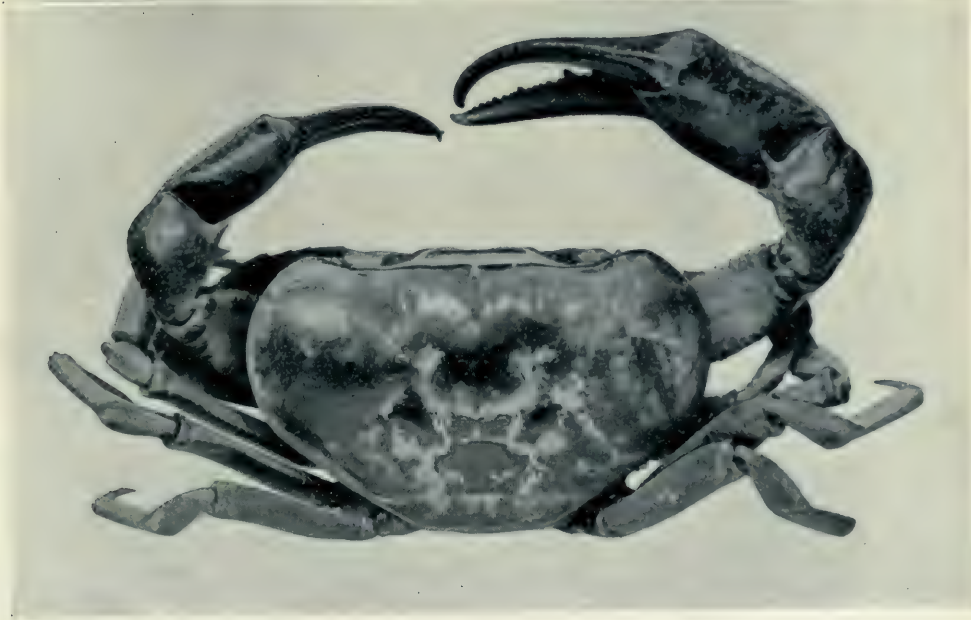
PLATE XX

Fig. 1. *Callinectes marginatus*, female, 85 mm. wide, Banana, dorsal view.

Fig. 2. *Potamon* (*Potamonautes*) *floweri*, male, 59.8 mm. wide, Nepoko River, dorsal view.



1



2

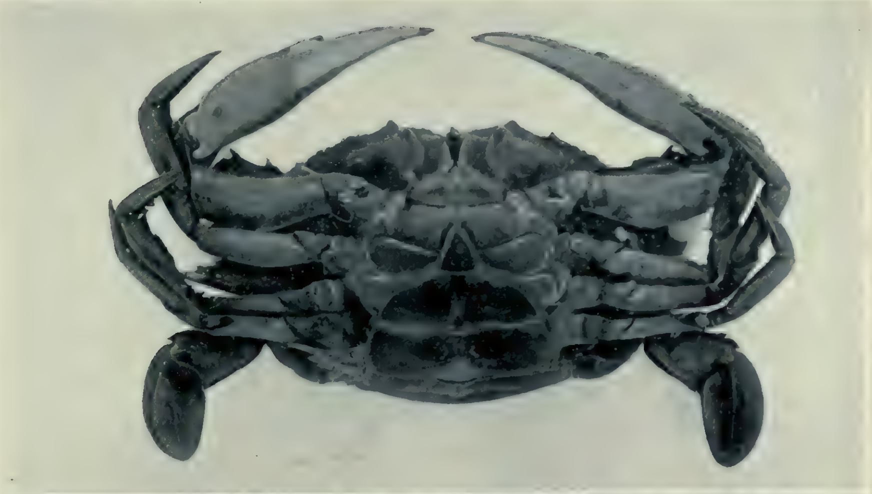
Plate XXI

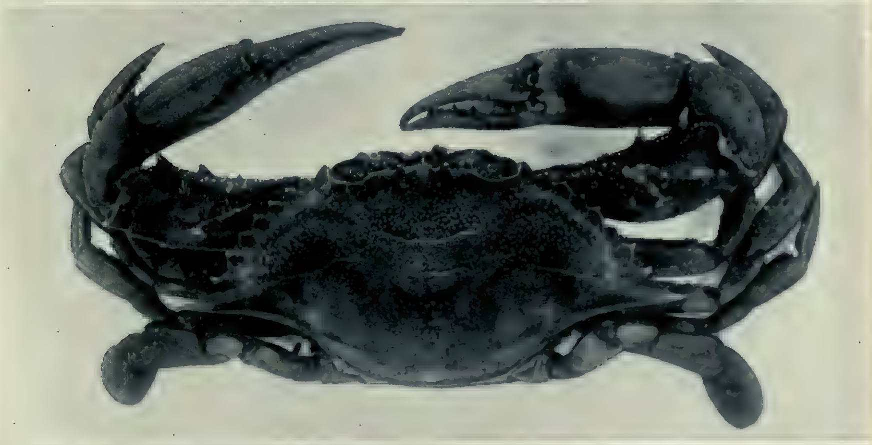
Callinectes latimanus

Fig. 1. Female, 130 mm. wide, A. M. N. H. No. 3112, ventral view.

Fig. 2. Male, 142 mm. wide, A. M. N. H. No. 3272, dorsal view, carapace foreshortened.

Fig. 3. Same specimen, ventral view.


1


2

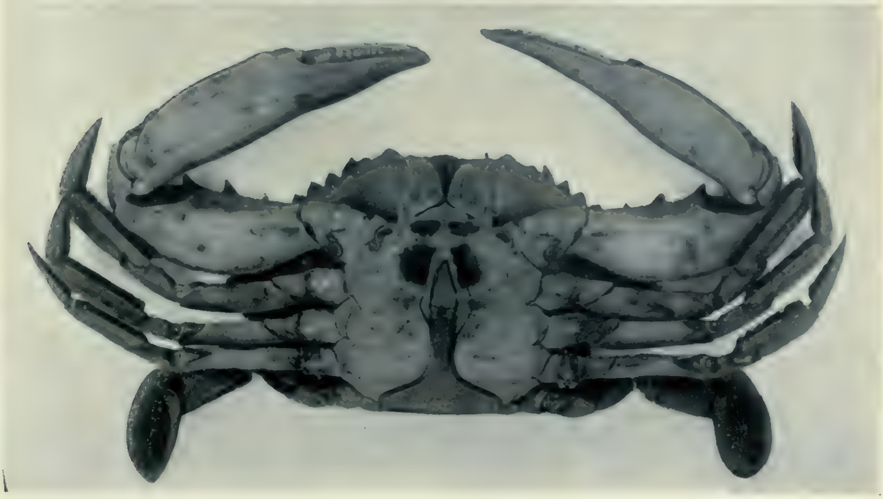
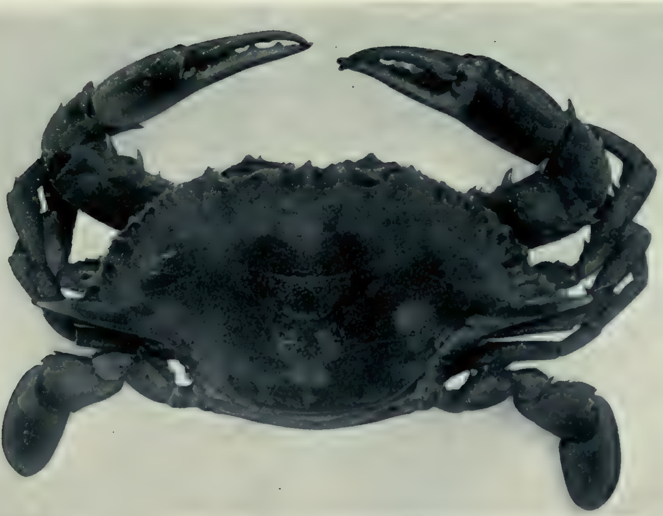

3

Plate XXII

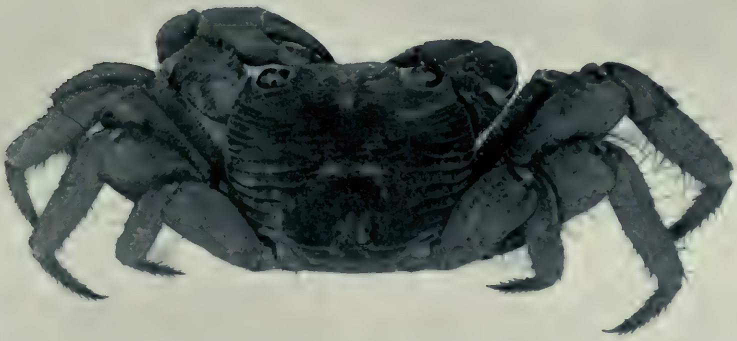
Fig. 1. *Callinectes latimanus*, female, 130 mm. wide, A. M. N. H. No. 3112, dorsal view.

Fig. 2. *Geograpsus lividus*, male, 35 mm. wide, A. M. N. H. No. 3069, dorsal view.

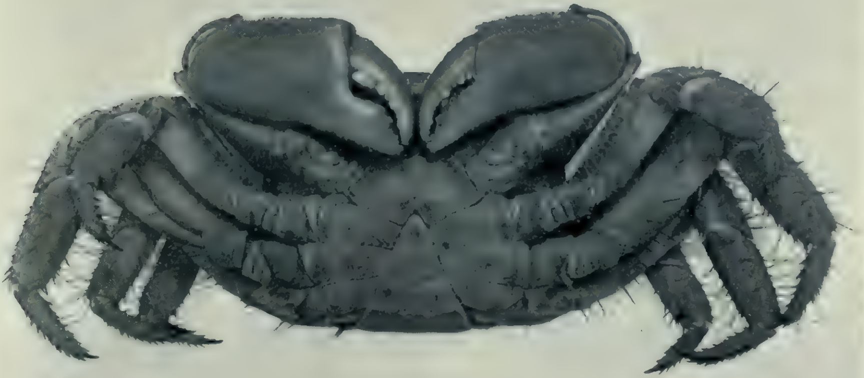
Fig. 3. Same species, very large male, A. M. N. H. No. 3069, ventral view.



1



2



3

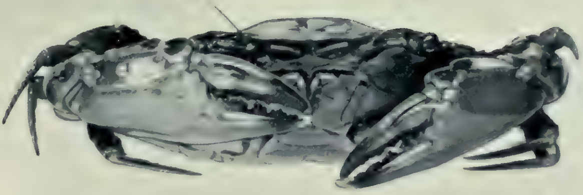
PLATE XXIII

Thalamita africana, St. Paul de Loanda

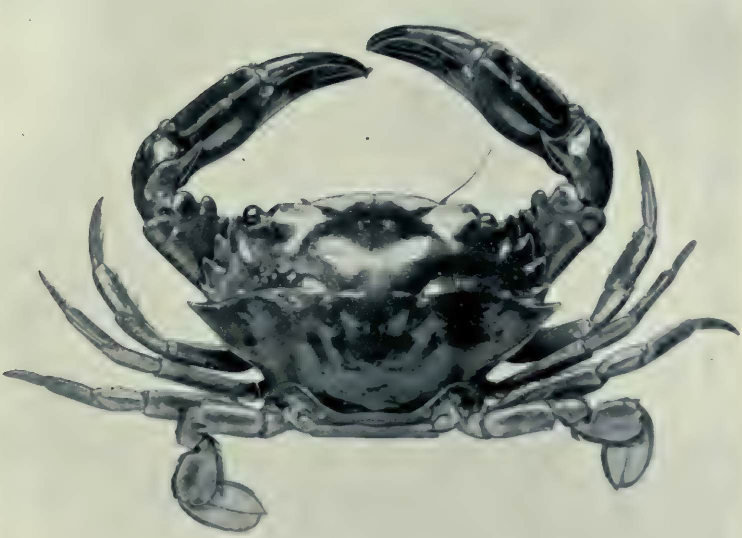
Fig. 1. Male, 41 mm. wide, front view.

Fig. 2. Same, dorsal view.

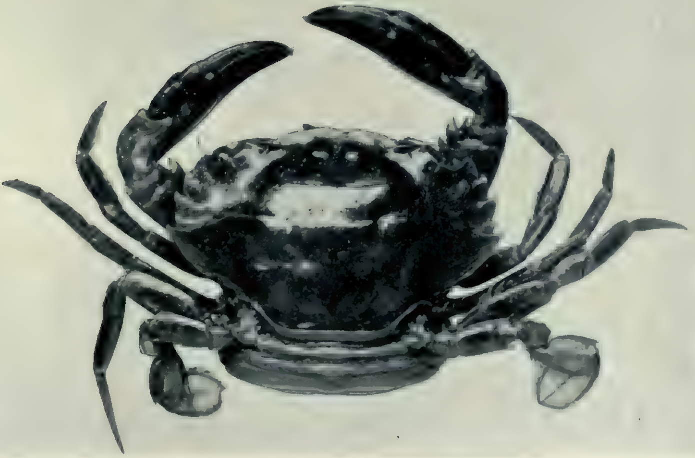
Fig. 3. Female, 29.4 mm. wide, dorsal view.



1



2



3

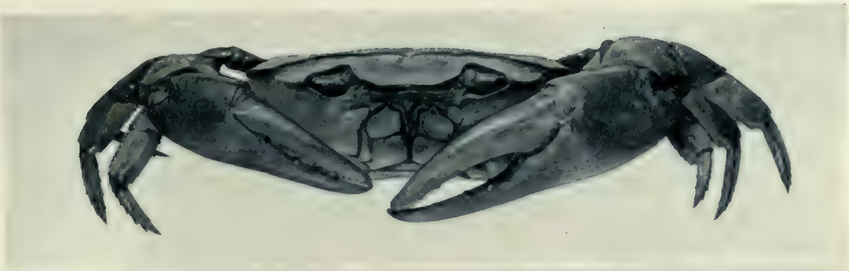
PLATE XXIV

Potamon (Potamonautes) dybowskii, male, 58.6 mm. wide, Nepoko River

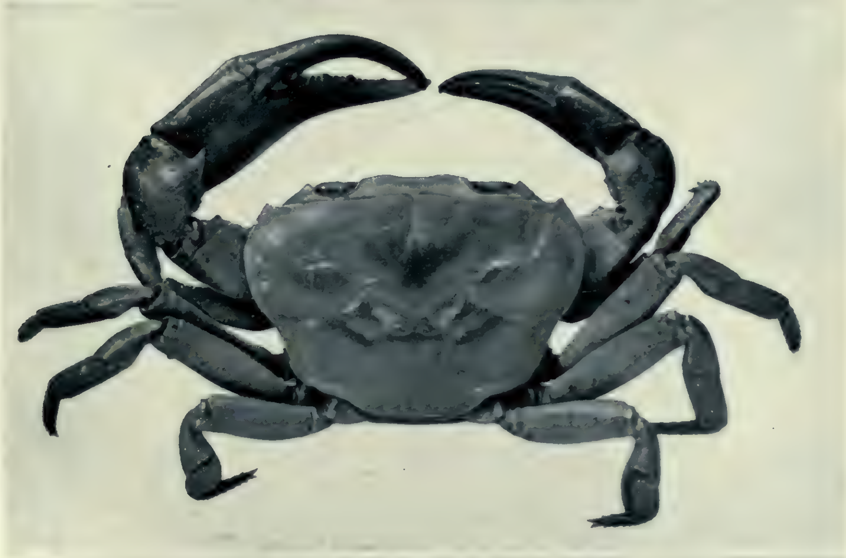
Fig. 1. Front view.

Fig. 2. Dorsal view.

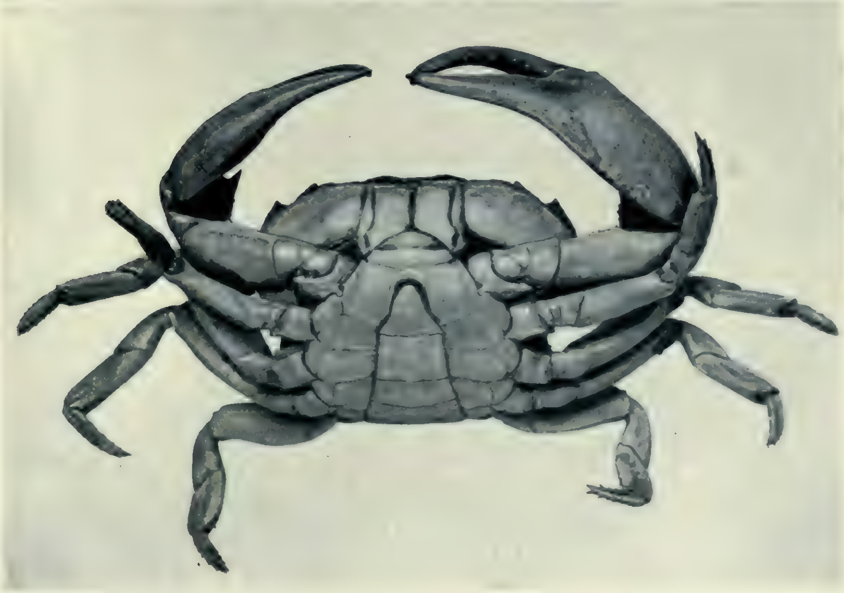
Fig. 3. Ventral view.



1



2



3

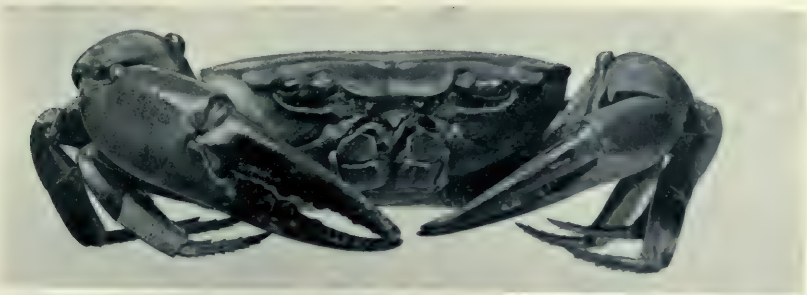
PLATE XXV

Potamon (*Potamonautes*) *lirrangensis*, male, 62 mm. wide, Stanleyville

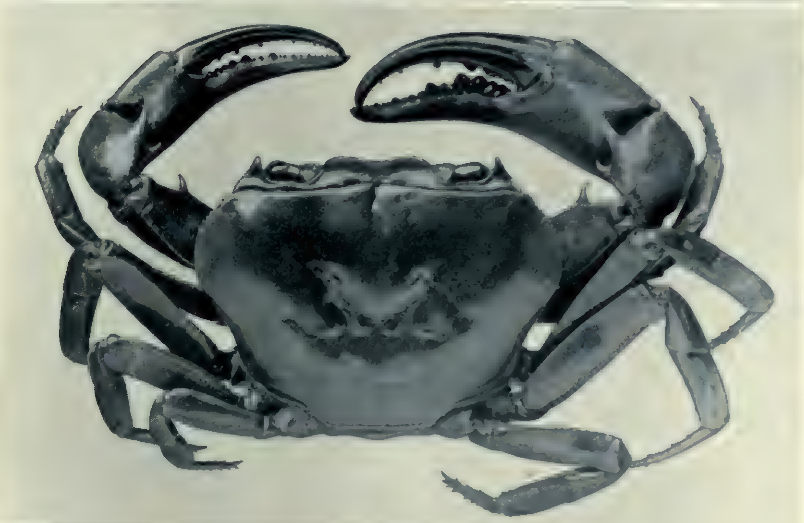
Fig. 1. Front view.

Fig. 2. Dorsal view.

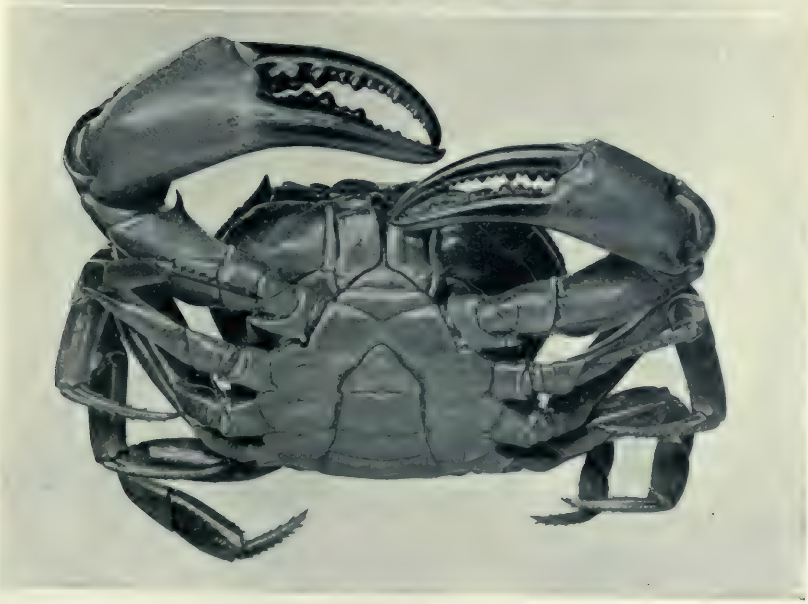
Fig. 3. Ventral view.



1



2



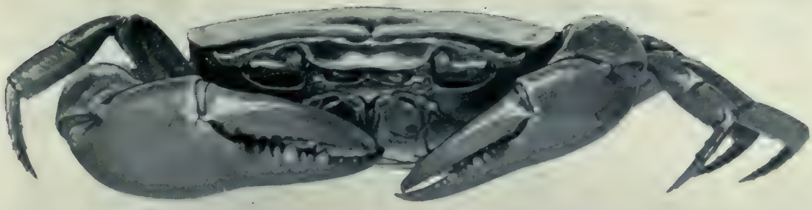
3

PLATE XXVI

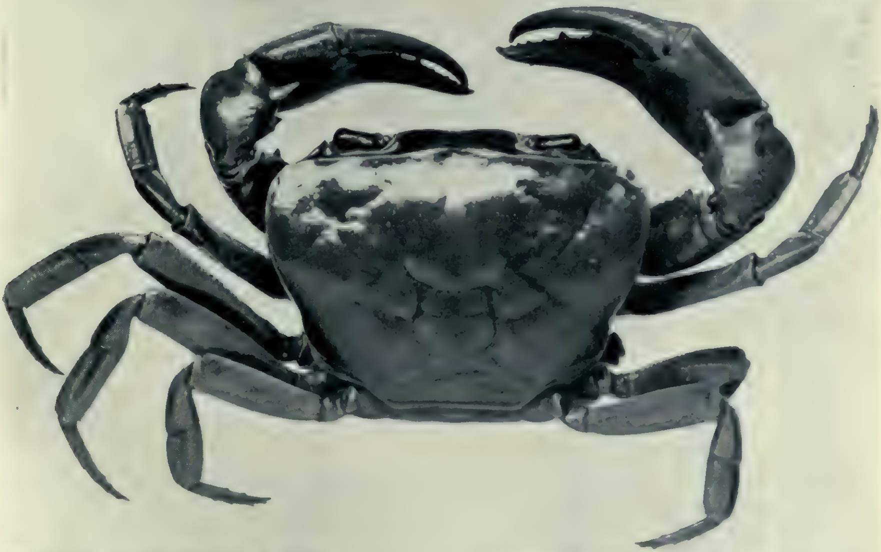
Fig. 1. *Potamon* (*Potamonautes*) *stanleyensis*, male holotype, 34.7 mm. wide, front view.

Fig. 2. Same, dorsal view.

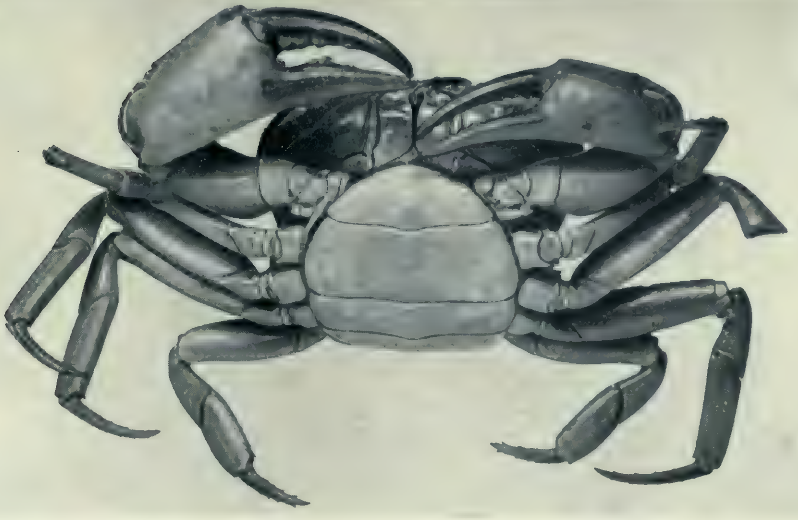
Fig. 3. *Potamon* (*Potamonautes*) *lirrangensis*, female, 61 mm. wide, Stanleyville, ventral view.



1



2



3

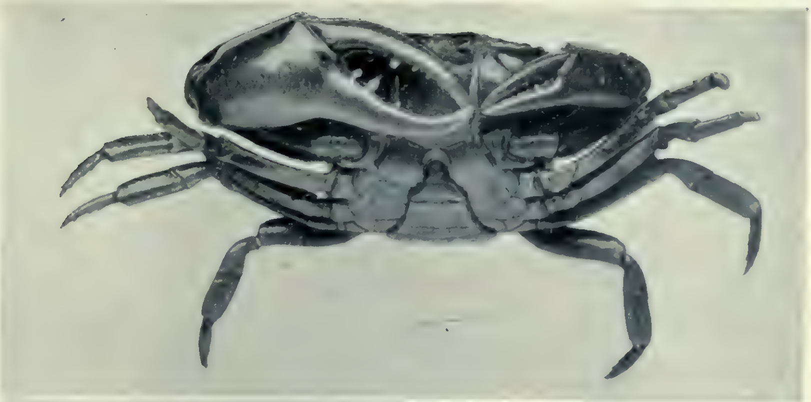
Plate XXVII

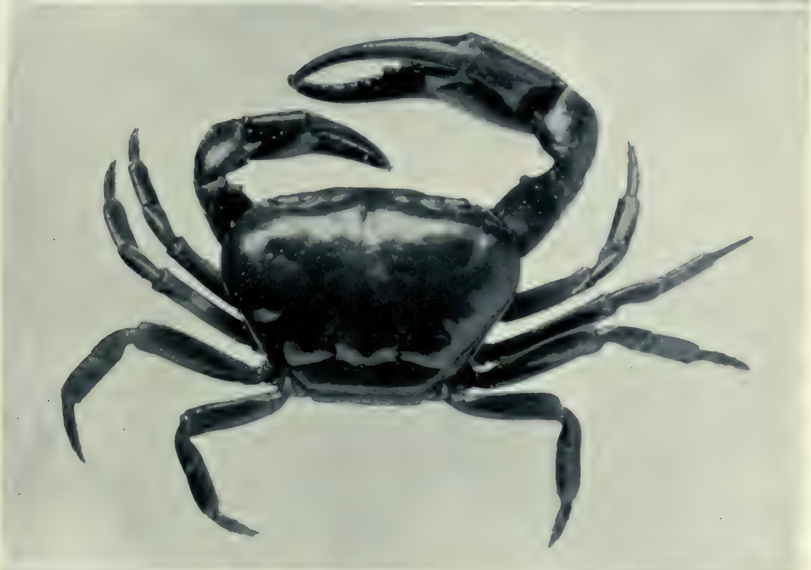
Potamon (Potamon) ballayi, Stanleyville

Fig. 1. Male, 27.4 mm. wide, ventral view.

Fig. 2. Same, dorsal view.

Fig. 3. Female, 29.8 mm. wide, ventral view.


1


2

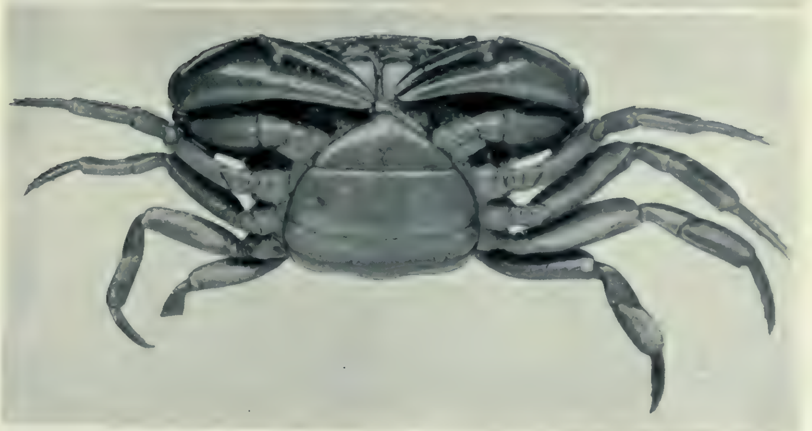
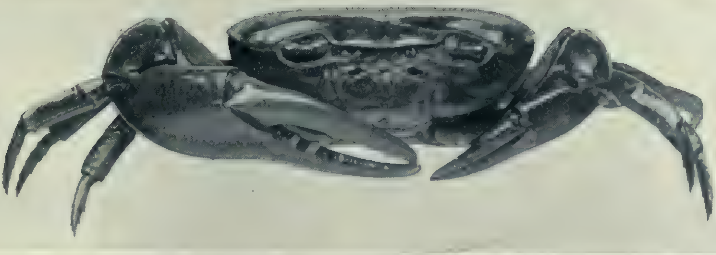

3

PLATE XXVIII

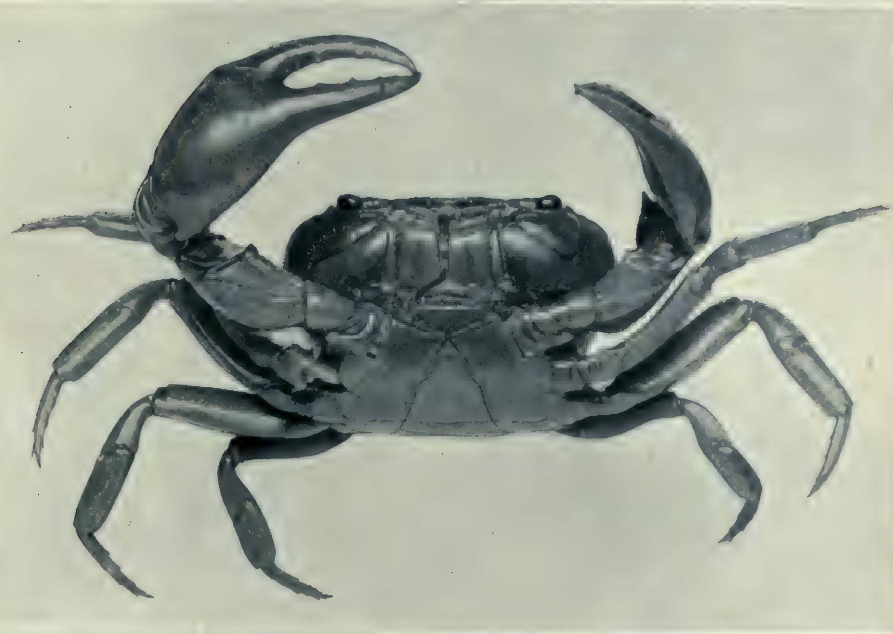
Fig. 1. *Potamon* (*Potamon*) *ballayi*, male, 27.4 mm. wide, Stanleyville, front view.

Fig. 2. *Potamon* (*Geothelphusa*) *perparvus*, male holotype, 19.6 mm. wide, ventral view.

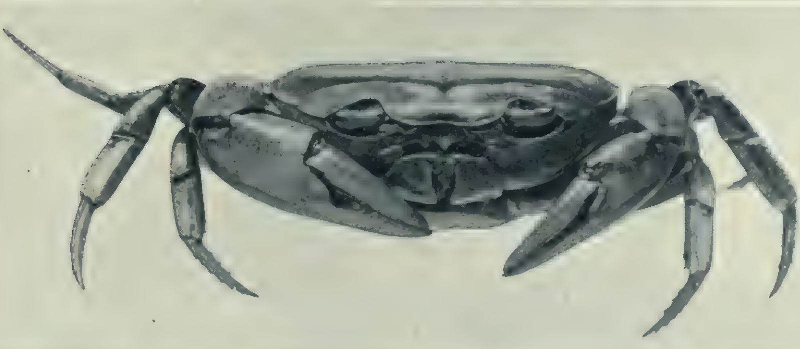
Fig. 3. *Potamon* (*Geothelphusa*) *congoënsis*, female, 31.7 mm. wide, Poko, front view.



1



2



3

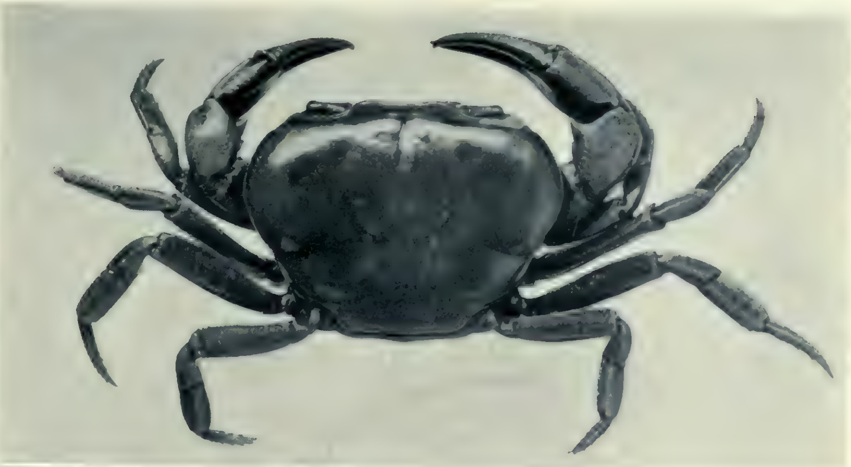
PLATE XXIX

Potamon (Geothelphusa) congoënsis

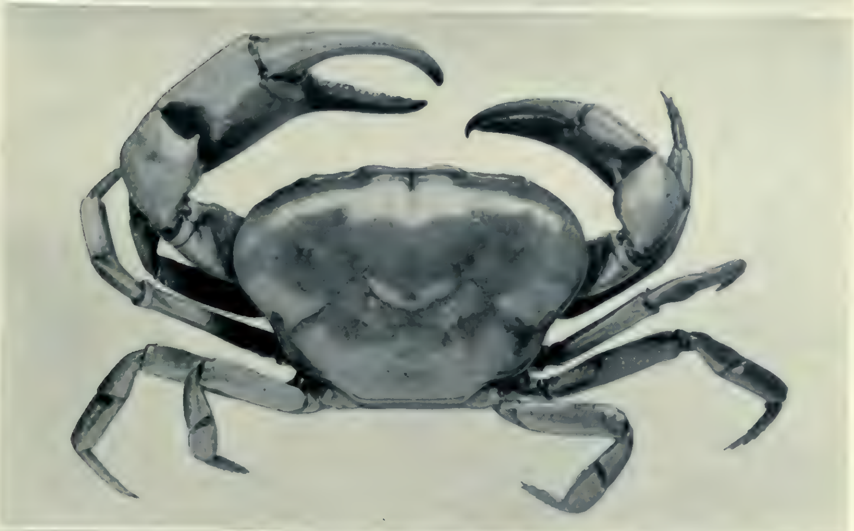
Fig. 1. Female, 31.7 mm. wide, Poko, dorsal view.

Fig. 2. Male holotype, 44 mm. wide, dorsal view.

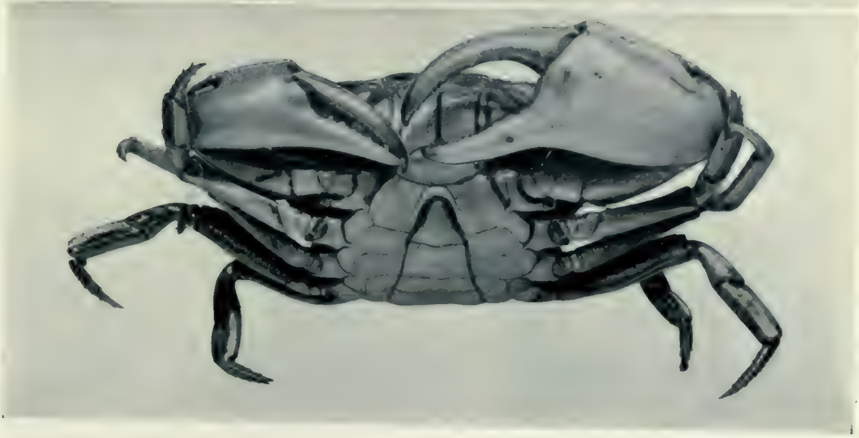
Fig. 3. Same, ventral view.



1



2



3

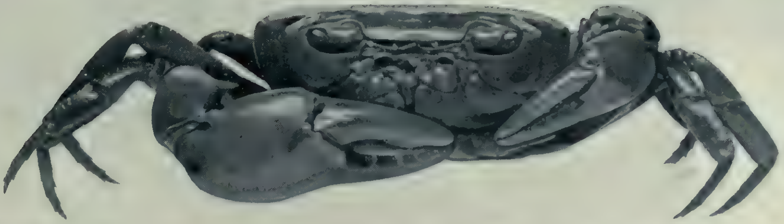
Plate XXX

Potamon (Geothelphusa) perparvus

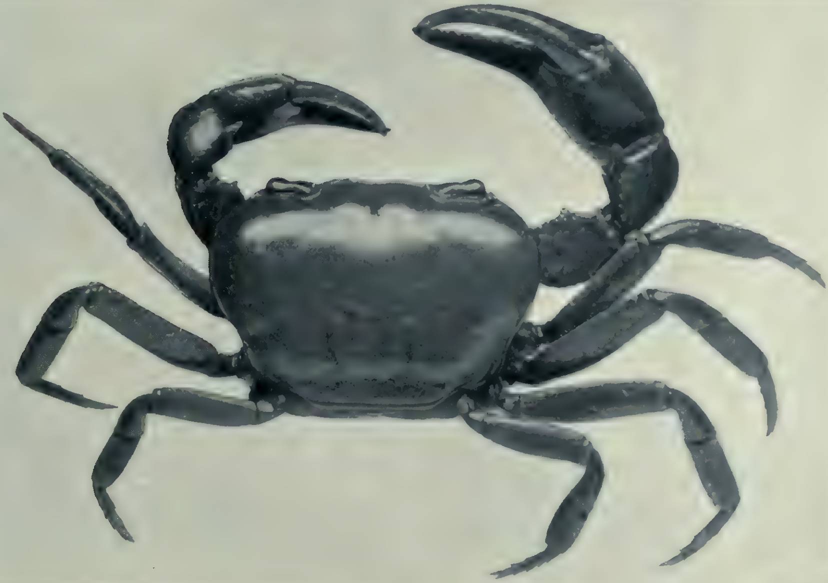
Fig. 1. Male holotype, 19.6 mm. wide, front view.

Fig. 2. Same, dorsal view.

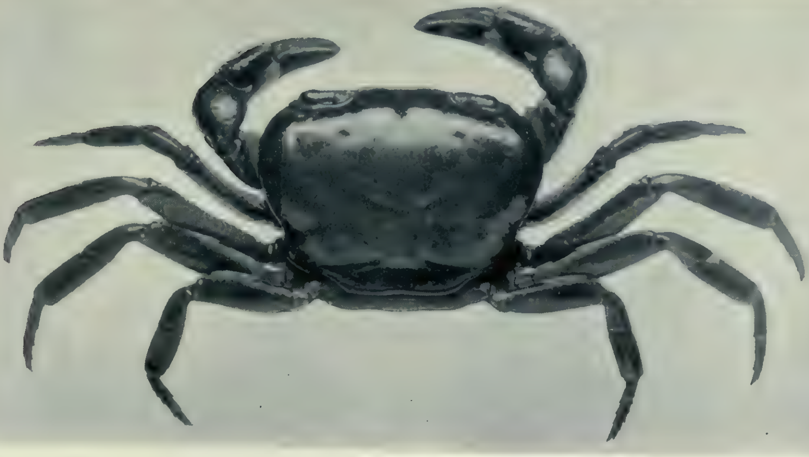
Fig. 3. Female, 17.2 mm. wide, Stanleyville, dorsal view.



1



2



3

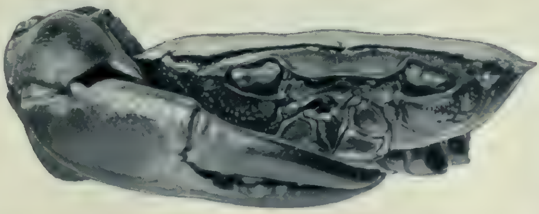
PLATE XXXI

Potamon (Acanthothelphusa) faradjensis

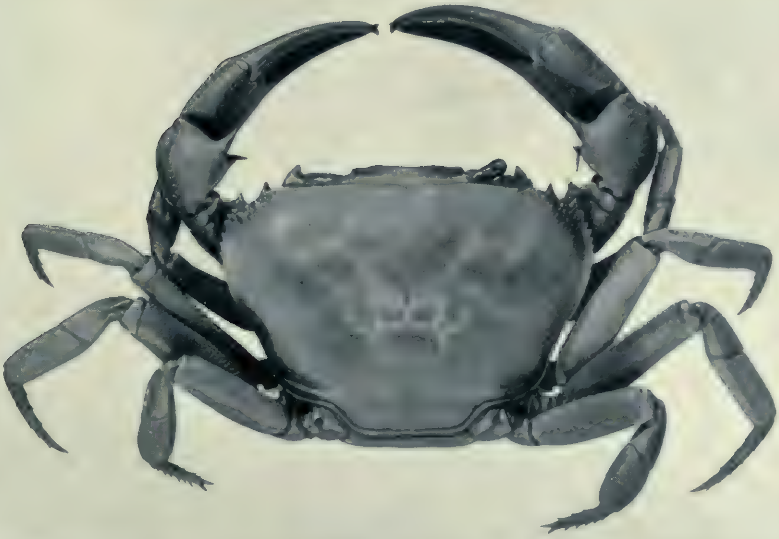
Fig. 1. Male holotype, 74 mm. wide, front view.

Fig. 2. Female, 68.5 mm. wide, Faradje, dorsal view.

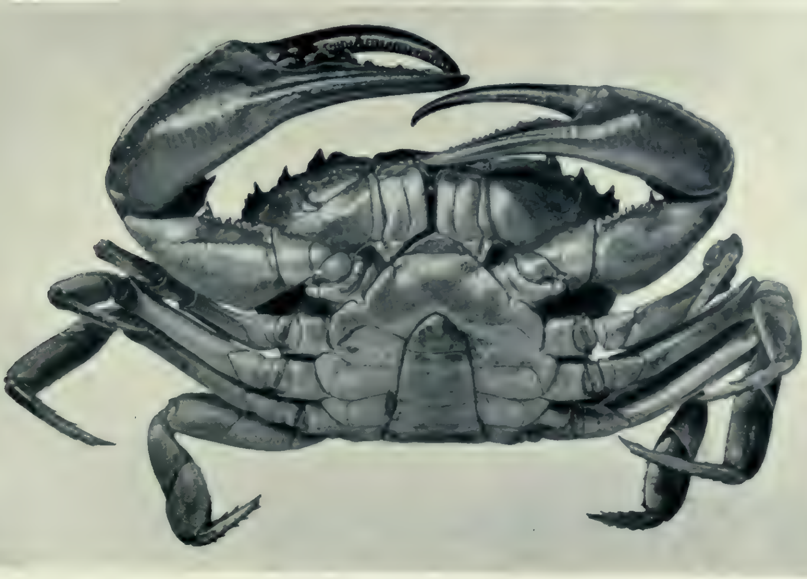
Fig. 3. Male holotype, ventral view.



1



2



3

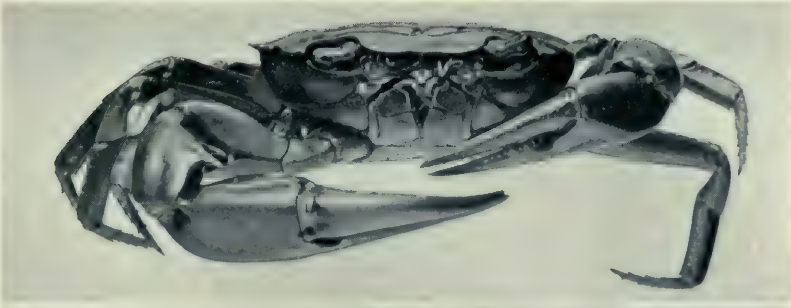
Plate XXXII

Potamon (*Acanthothelphusa*) *langi*, male holotype, 49 mm. wide

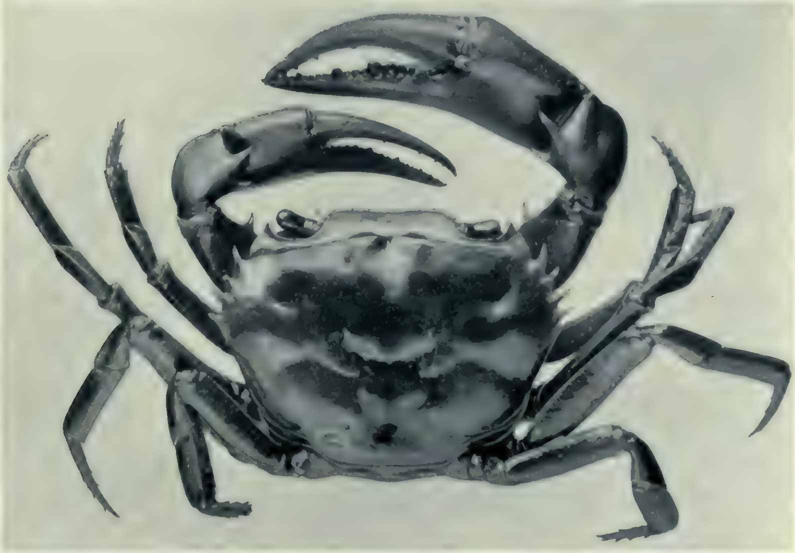
Fig. 1. Front view.

Fig. 2. Dorsal view.

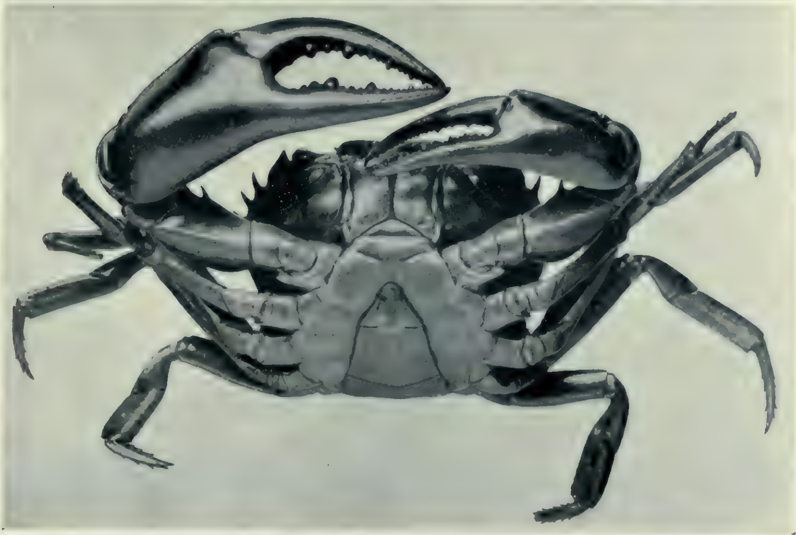
Fig. 3. Ventral view.



1



2



3

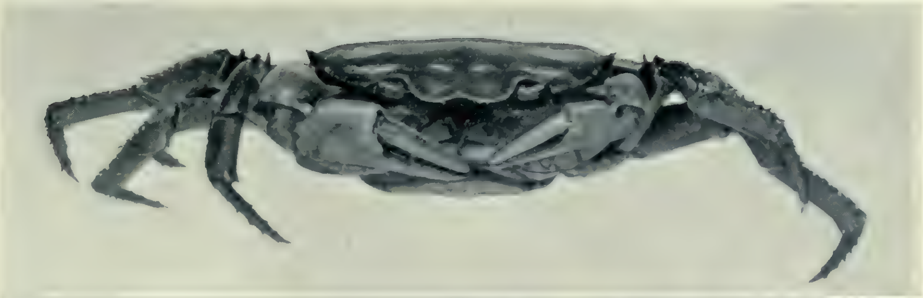
PLATE XXXIII

Erimetopus brazzæ, female, 82 mm. wide, Leopoldville

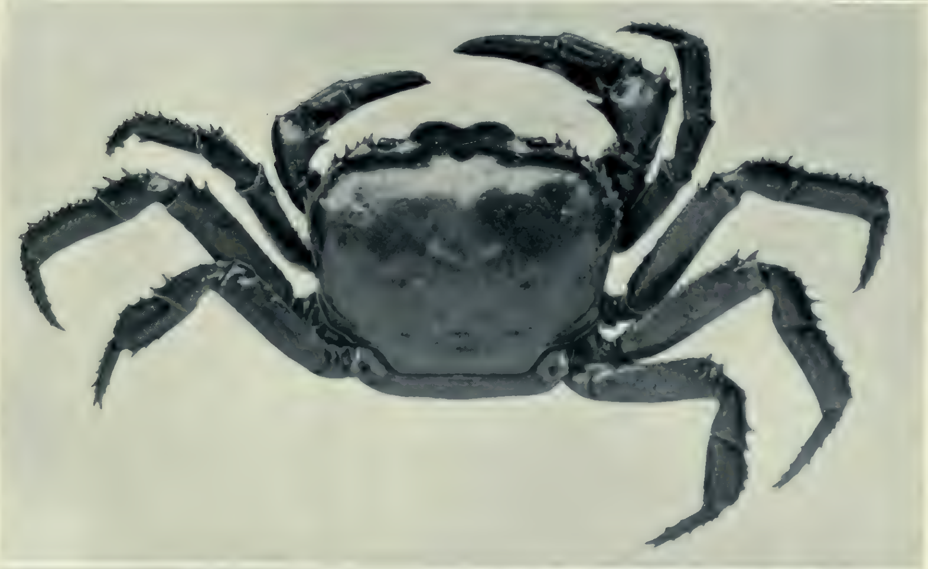
Fig. 1. Front view.

Fig. 2. Dorsal view.

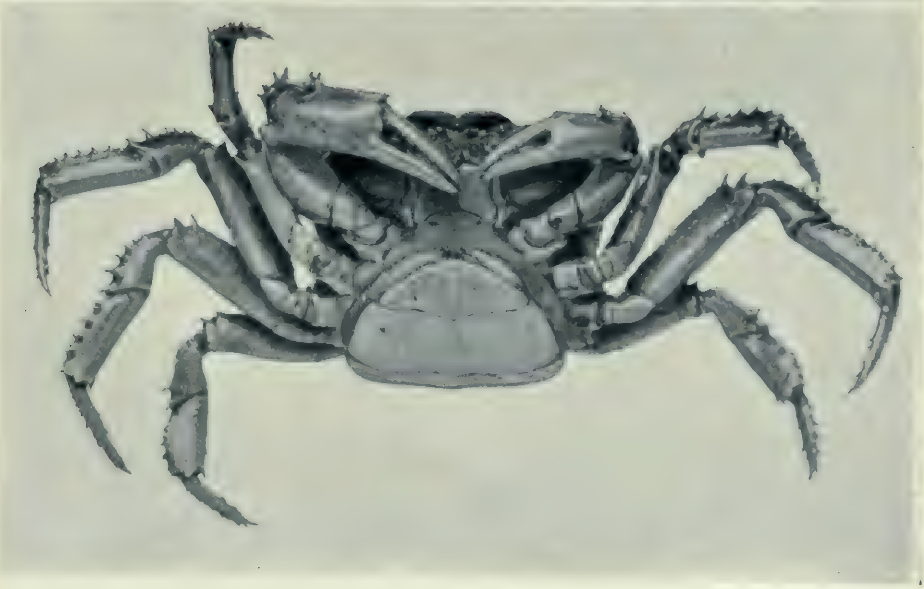
Fig. 3. Ventral view.



1



2



3

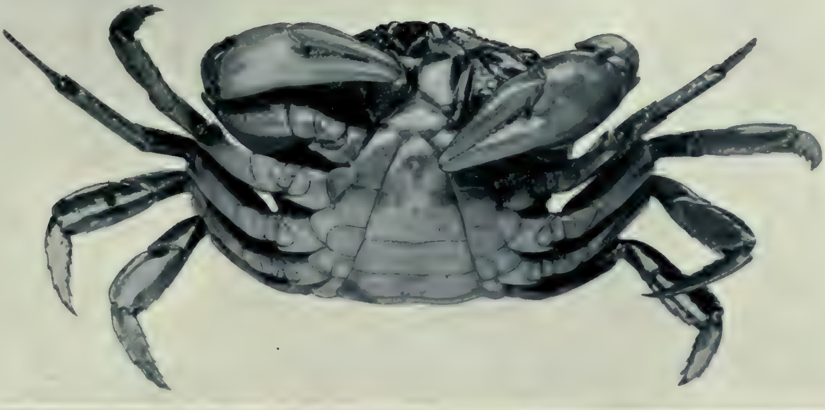
Plate XXXIV

Deckenia mitis, male, 36 mm. wide, U. S. N. M. No. 32298

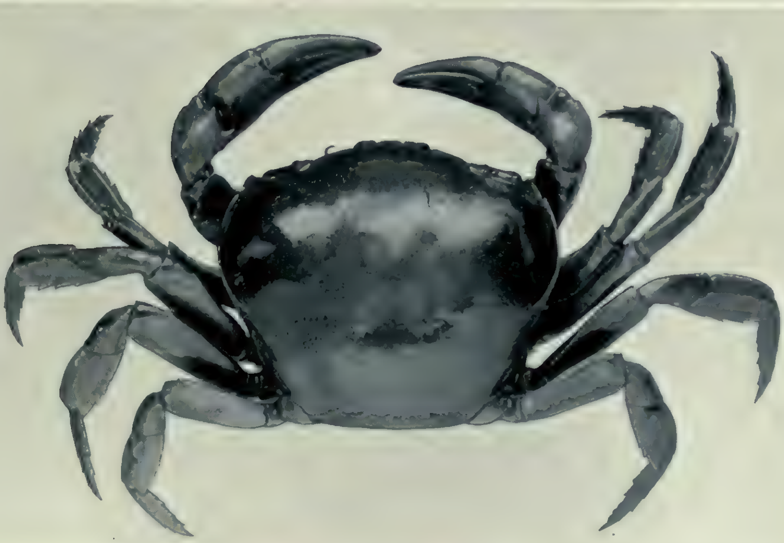
Fig. 1. Ventral view.

Fig. 2. Dorsal view.

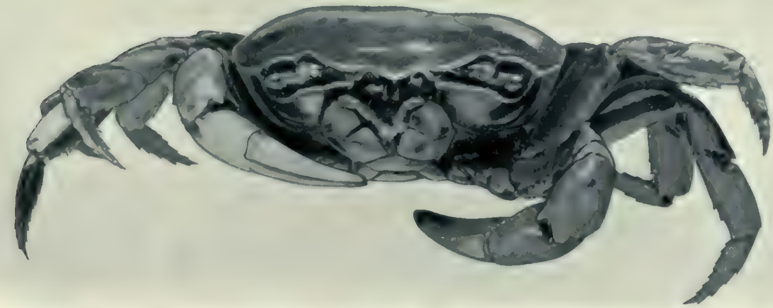
Fig. 3. Front view.



1



2



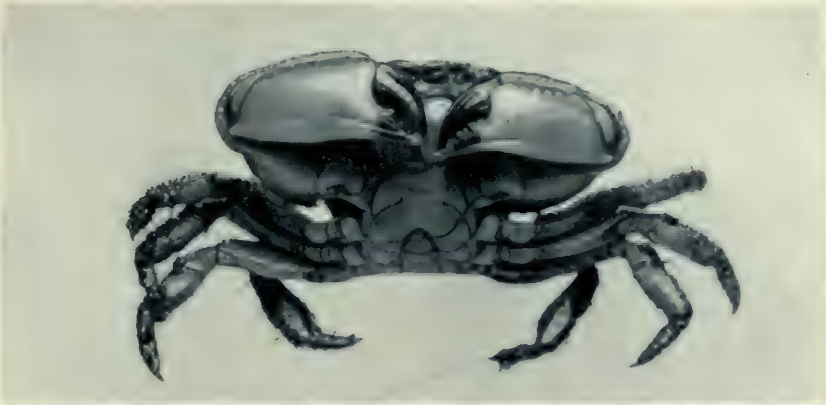
3

PLATE XXXV

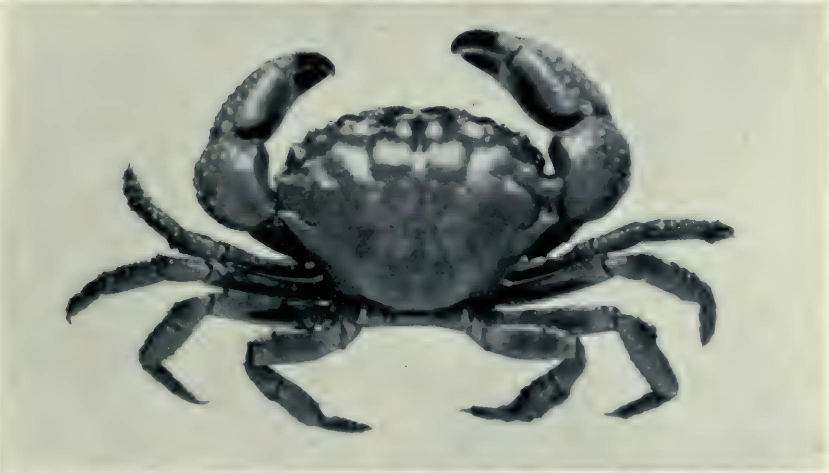
Fig. 1. *Menippe nanus*, male, 10.7 mm. wide, Padron Point, ventral view.

Fig. 2. Same, dorsal view.

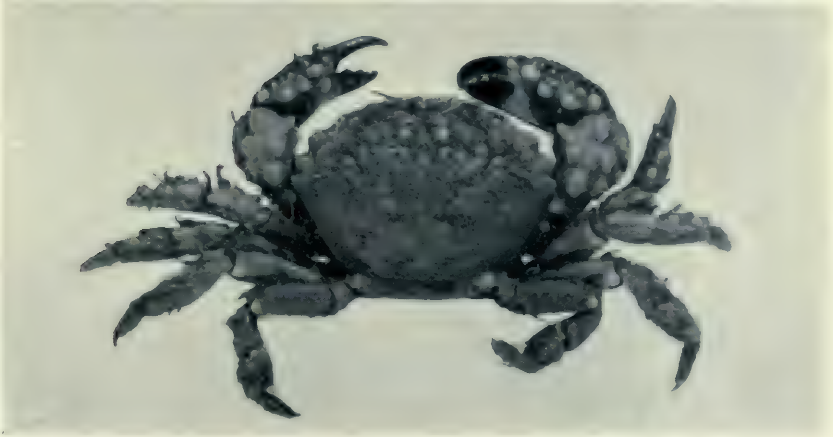
Fig. 3. *Pilumnus verrucosipes*, female, 9.6 mm. wide, St. Paul de Loanda, dorsal view.



1



2



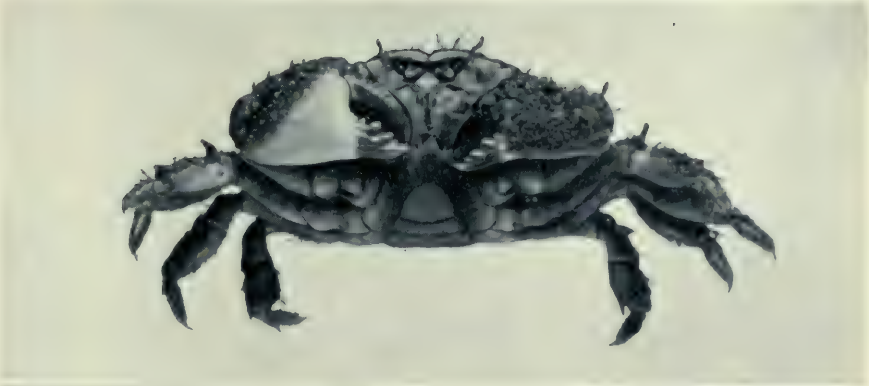
3

Plate XXXVI

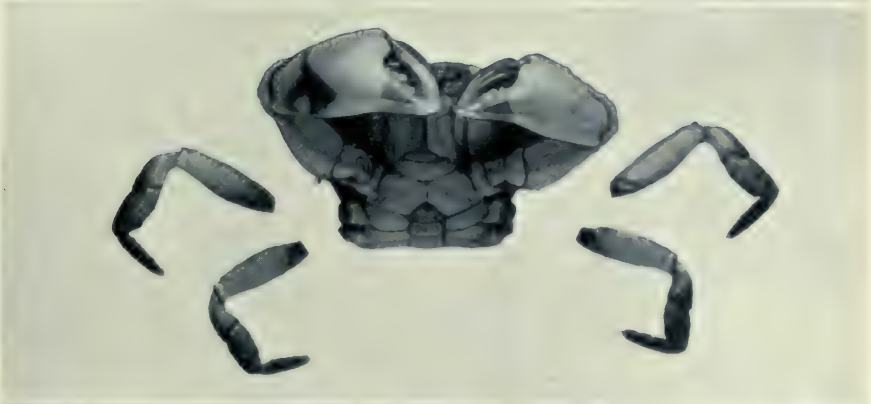
Fig. 1. *Pilumnus verrucosipes*, female, 9.6 mm. wide, St. Paul de Loanda, ventral view.

Fig. 2. *Eurypanopeus blanchardi* (?), male, 9.3 mm. wide, San Antonio, ventral view of body, chelipeds and four loose legs.

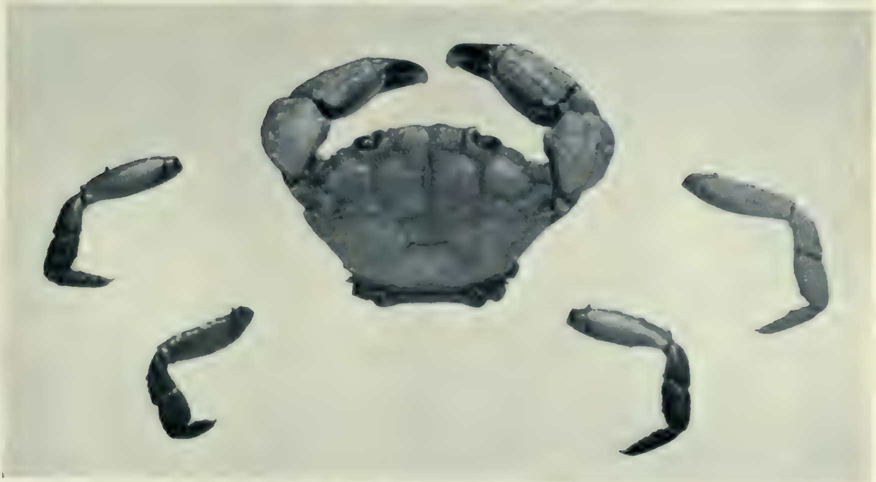
Fig. 3. Same, dorsal view.



1



2



3

PLATE XXXVII

Panopeus africanus, A. M. N. H. No. 3281

Fig. 1. Male, 38.5 mm. wide, ventral view.

Fig. 2. A smaller male, dorsal view.

Fig. 3. Female, ventral view.

All figures to same scale.

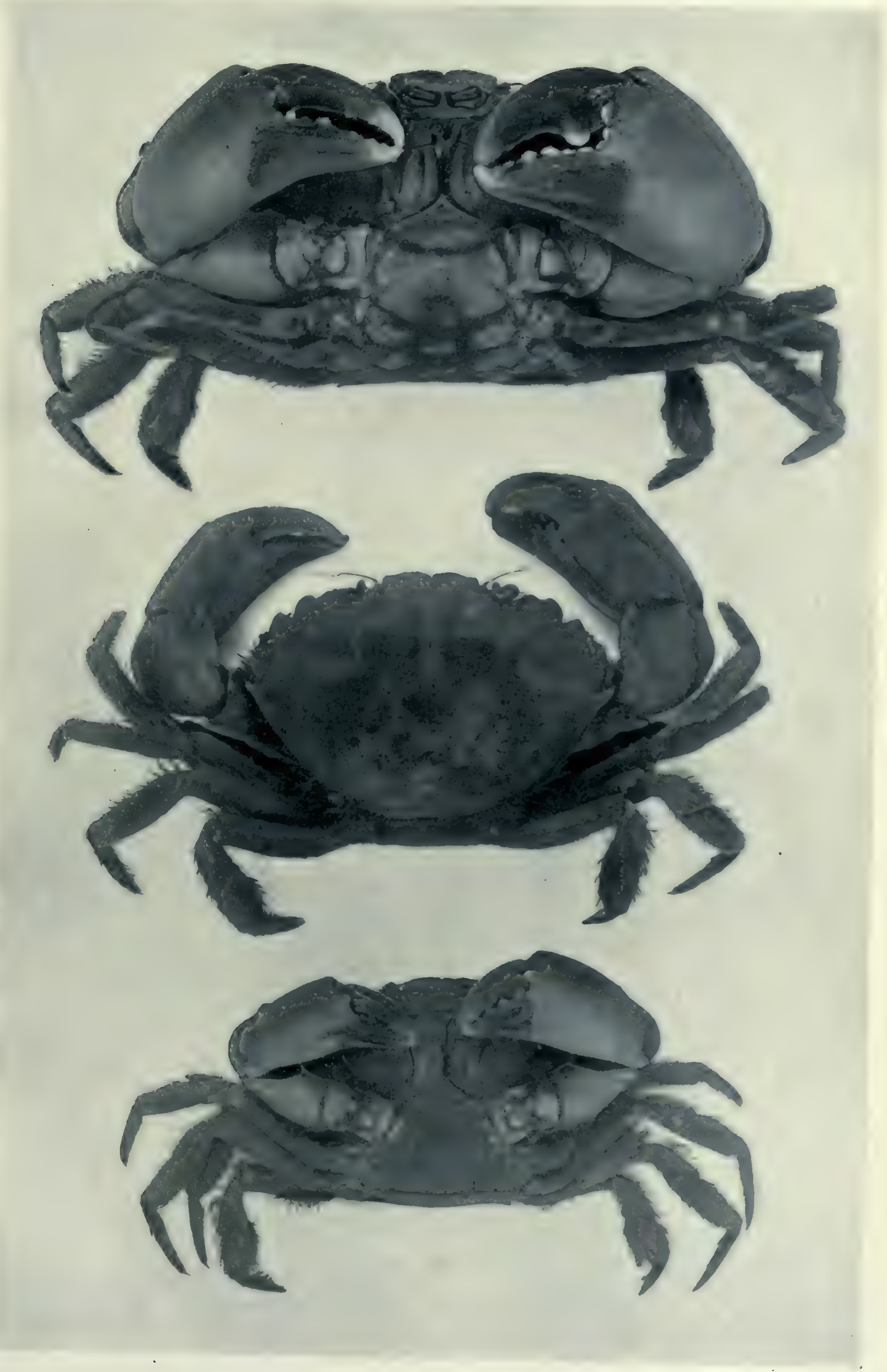

1
2
3

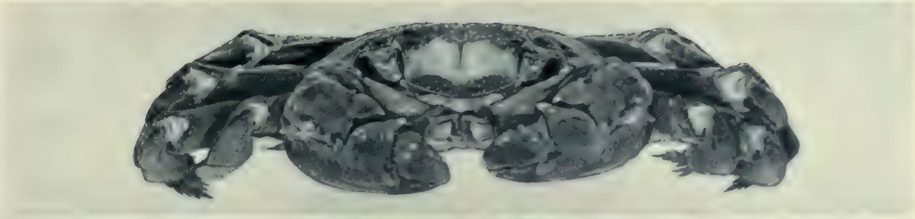
PLATE XXXVIII

Grapsus grapsus, A. M. N. H. No. 3070

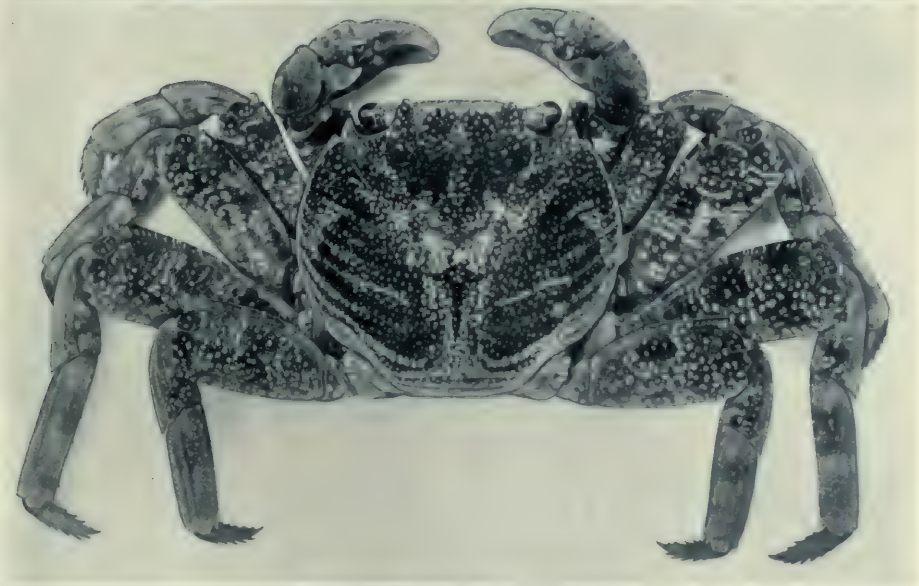
Fig. 1. Male, 64 mm. wide, front view.

Fig. 2. Same specimen, dorsal view.

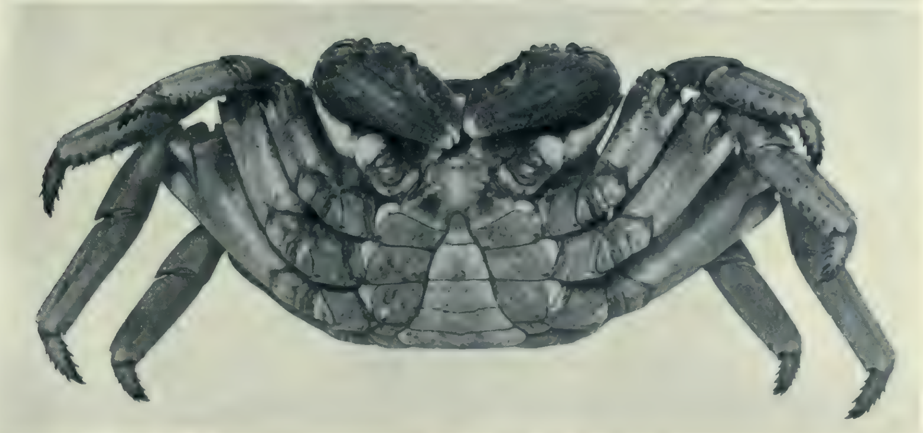
Fig. 3. A smaller male, ventral view.



1



2



3

PLATE XXXIX

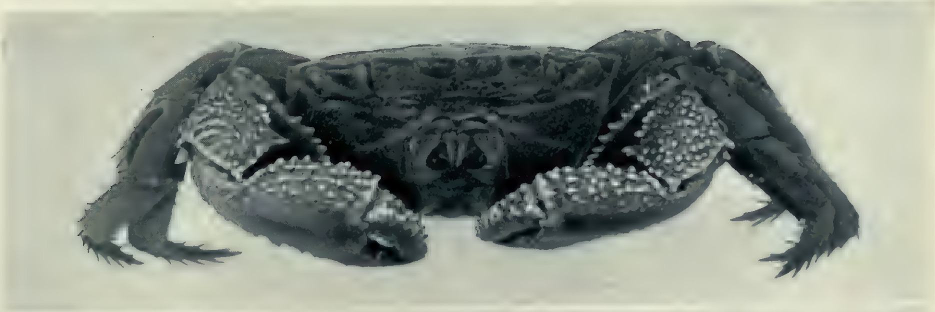
Goniopsis cruentata, A. M. N. H. No. 3084

Fig. 1. Male, 54 mm. wide, front view.

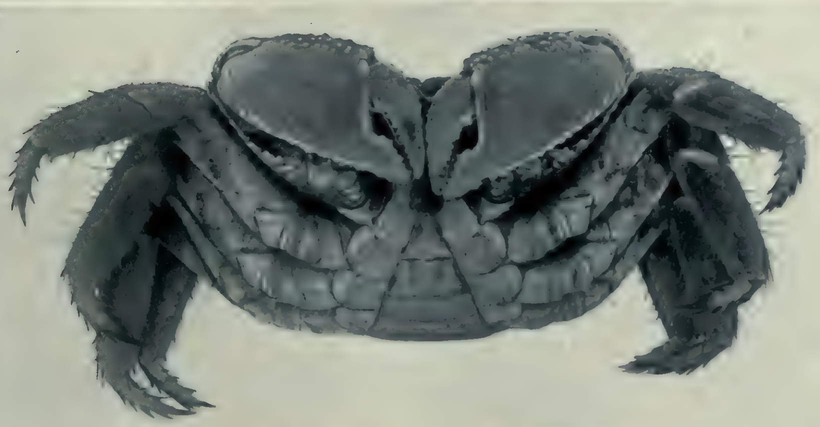
Fig. 2. Another male, ventral view.

Fig. 3. Same specimen as Fig. 1, dorsal view.

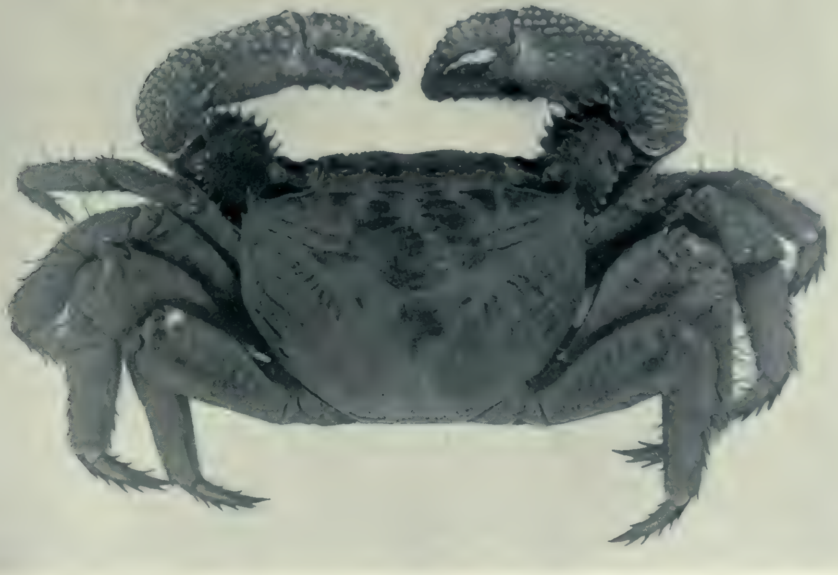
All figures to same scale.



1



2



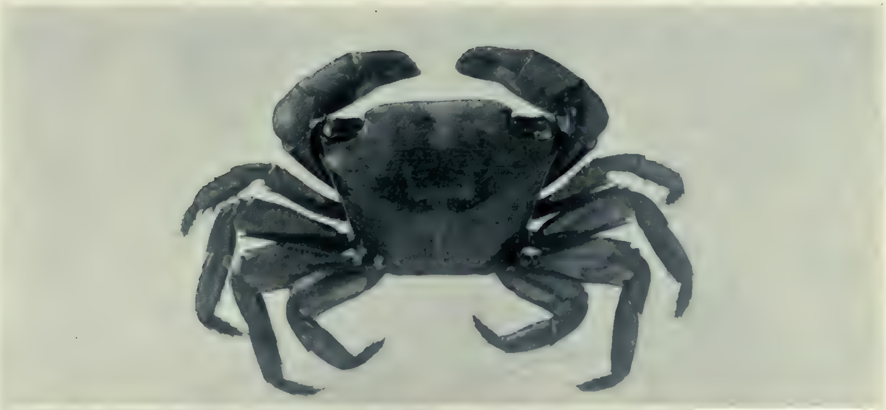
3

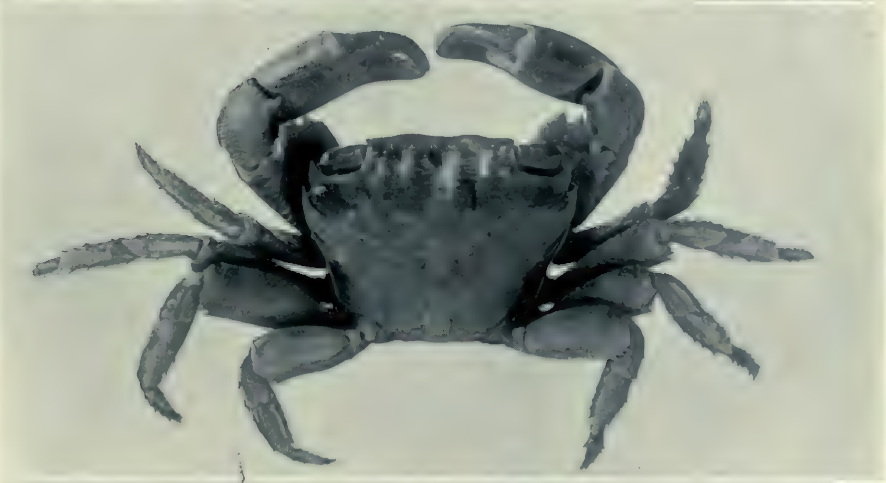
Plate XL

Fig. 1. *Pachygrapsus gracilis*, male, 16.6 mm. wide, U. S. N. M. No. 49254, dorsal view.

Fig. 2. *Pachygrapsus transversus*, male, 19.7 mm. wide, U. S. N. M. No. 40825, dorsal view.

Fig. 3. Same specimen, ventral view.


1


2

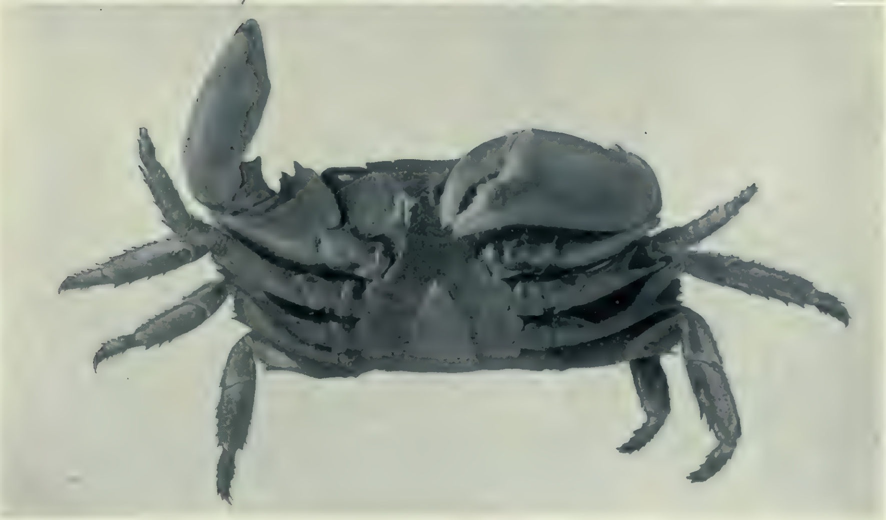

3

PLATE XLI

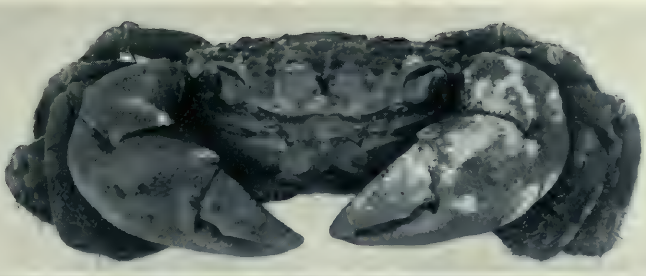
Sesarma (*Chiromantes*) *africanum*, A. M. N. H. No. 3279

Fig. 1. Male, 43 mm. wide, front view.

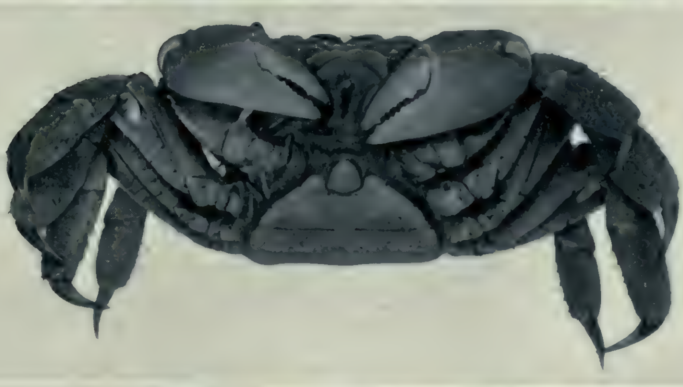
Fig. 2. Female, ventral view.

Fig. 3. Male, 41 mm. wide, dorsal view.

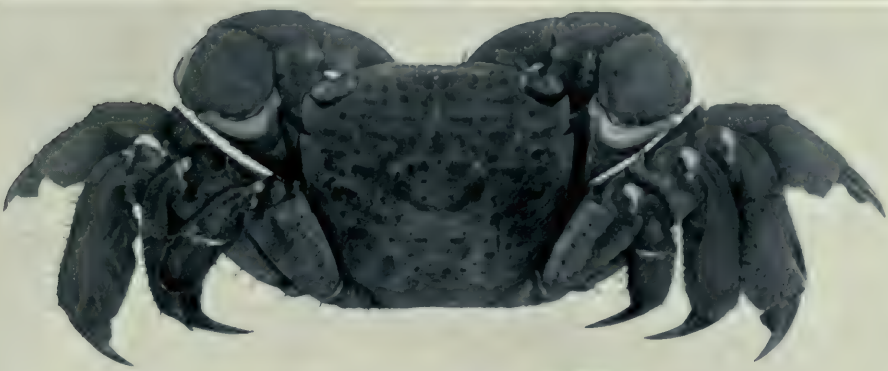
Fig. 4. Another male, ventral view.



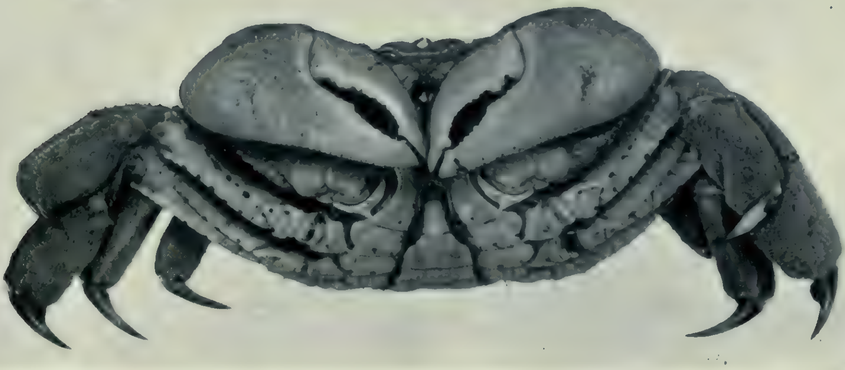
1



2



3



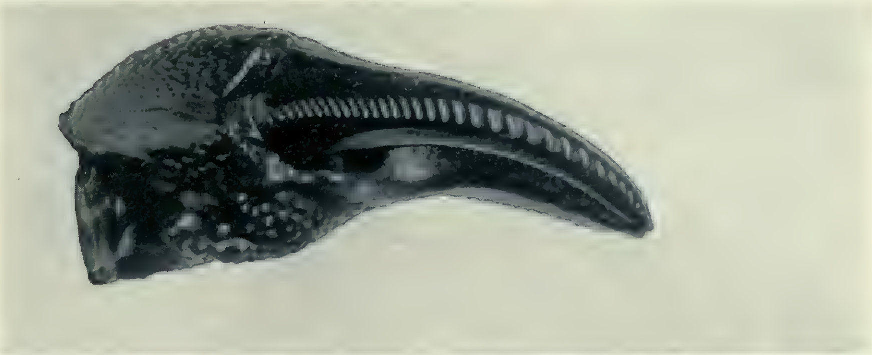
4

Plate XLII

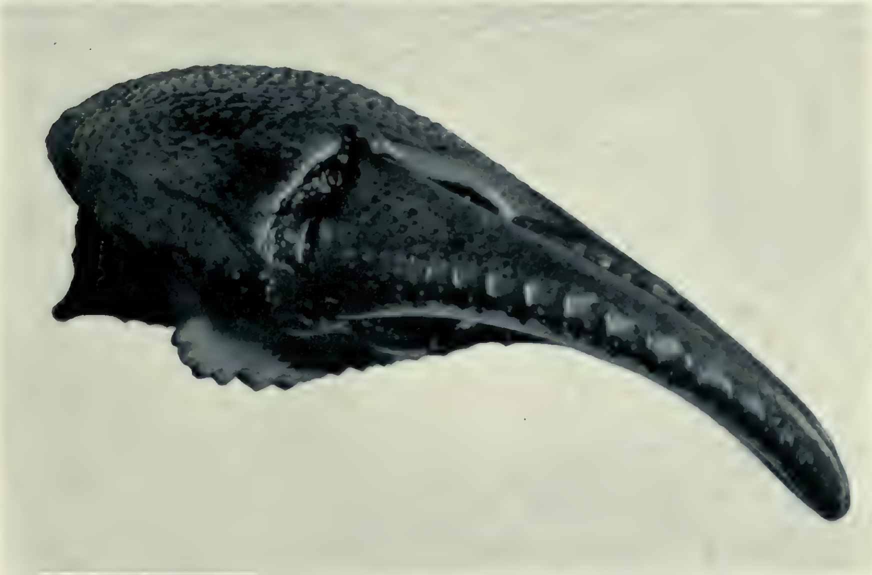
Fig. 1. *Sesarma* (*Chiromantes*) *alberti*, male holotype, dorsal view of left chela, finger 19.7 mm. long.

Fig. 2. *Sesarma* (*Chiromantes*) *africanum*, male, Banana, dorsal view of left chela, finger 28.3 mm. long.

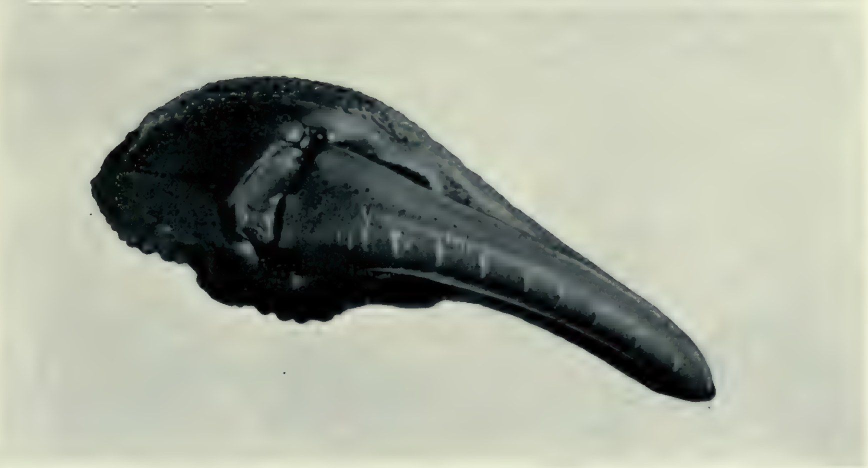
Fig. 3. *Sarmatium curvatum*, male, San Antonio, dorsal view of left chela, finger 22.1 mm. long.



1



2



3

PLATE XLIII

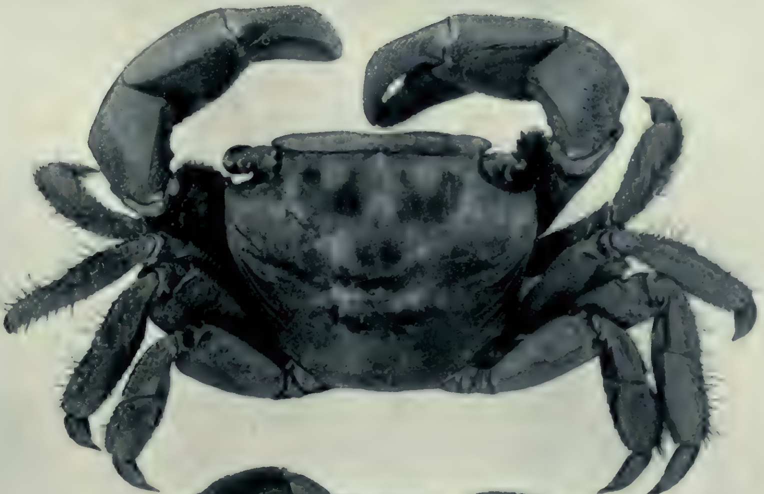
Sesarma (*Holometopus*) *angolense*, A. M. N. H. No. 3278

Fig. 1. Male, 46 mm. wide, dorsal view.

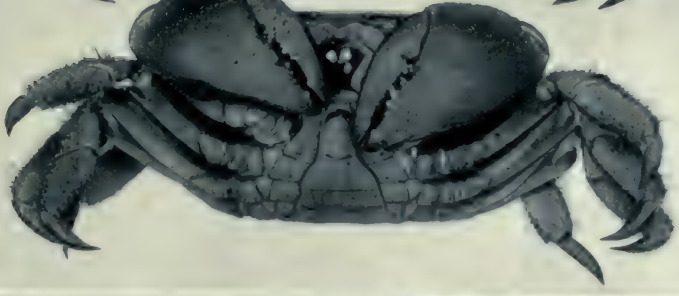
Fig. 2. A smaller male, ventral view.

Fig. 3. Female, ventral view.

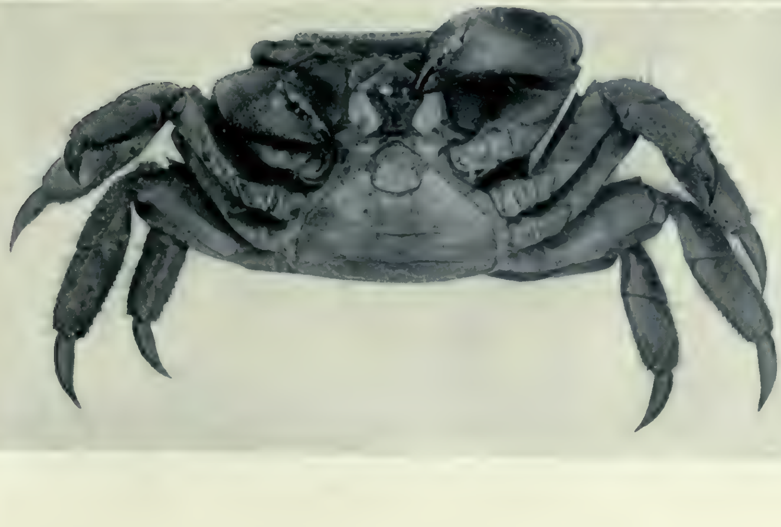
All figures to same scale.



1



2



3

PLATE XLIV

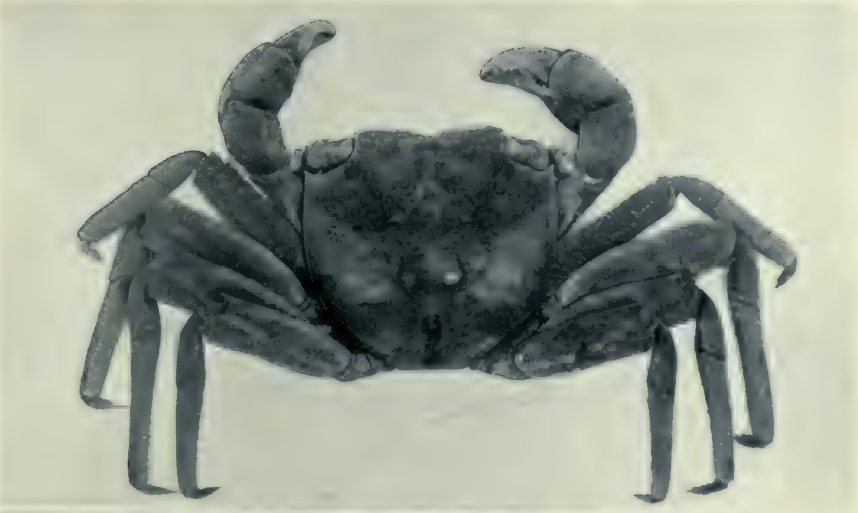
Sesarma (*Holometopus*) *elegans*, A. M. N. H. No. 3274

Fig. 1. Male, 21 mm. wide, dorsal view.

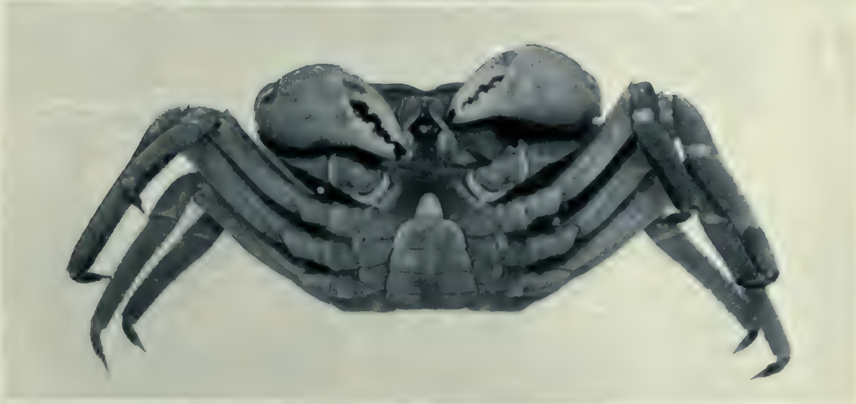
Fig. 2. A smaller male, ventral view.

Fig. 3. Female, ventral view.

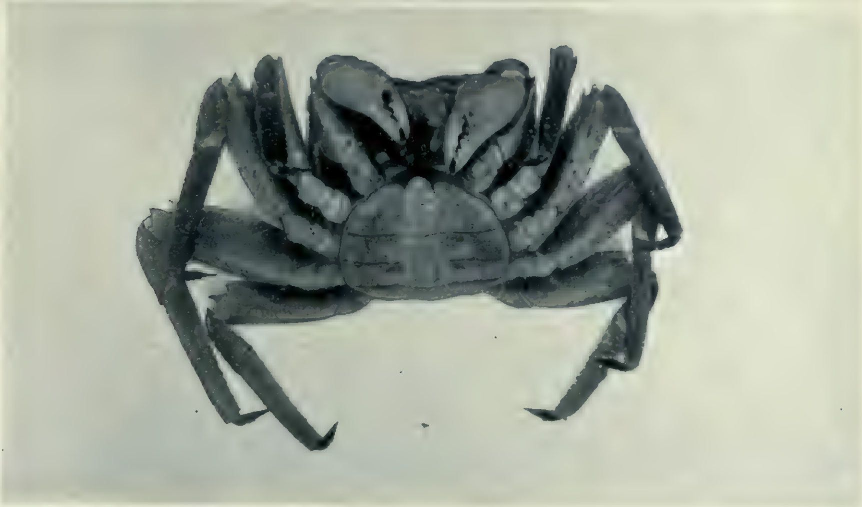
All figures to same scale.



1



2



3

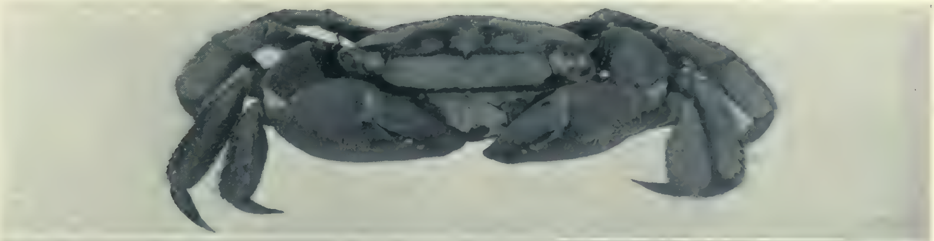
PLATE XLV

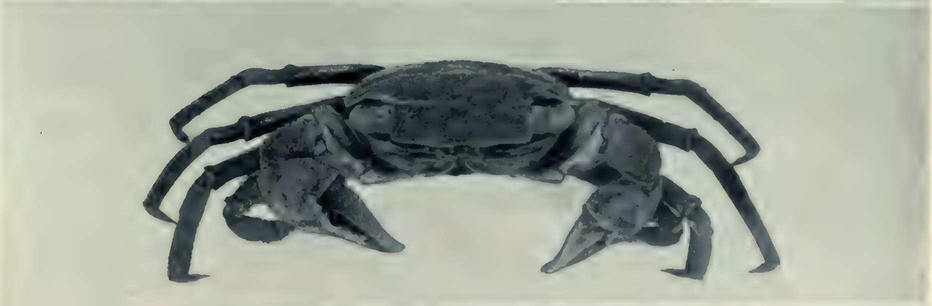
Fig. 1. *Sesarma* (*Holometopus*) *angolense*, male, A. M. N. H. No. 3278, front view.

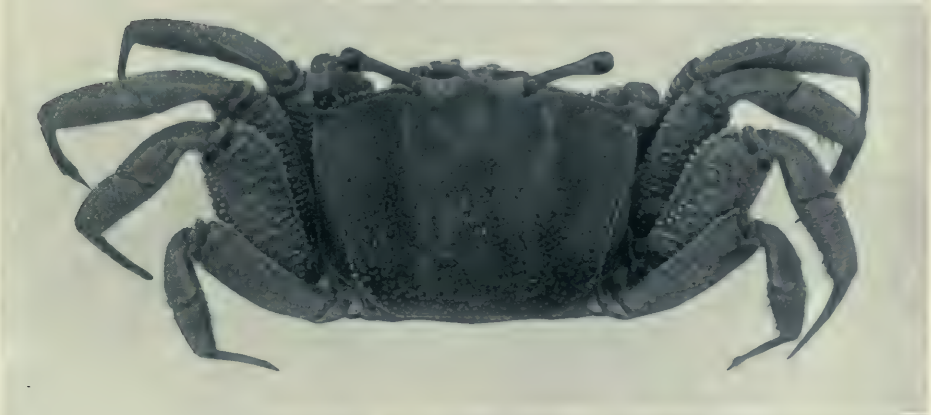
Fig. 2. *Sesarma* (*Holometopus*) *elegans*, male, A. M. N. H. No. 3274, front view.

Fig. 3. *Uca tangeri*, female, 29 mm. wide, A. M. N. H. No. 3275, dorsal view.

Fig. 4. Same species and No., a smaller female, ventral view.


1


2


3

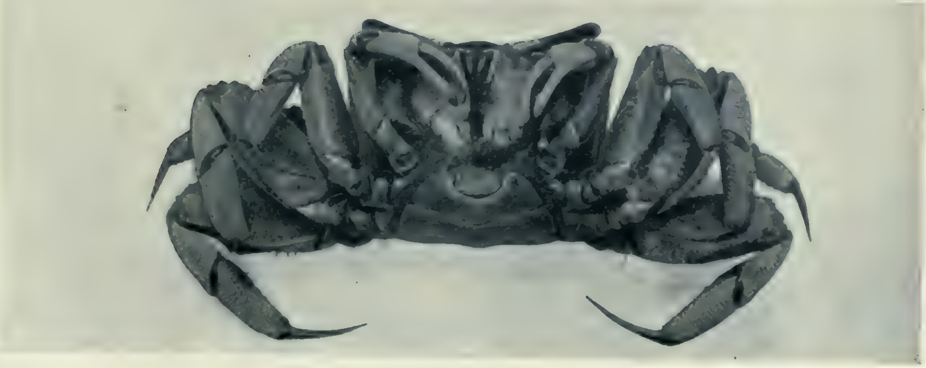

4

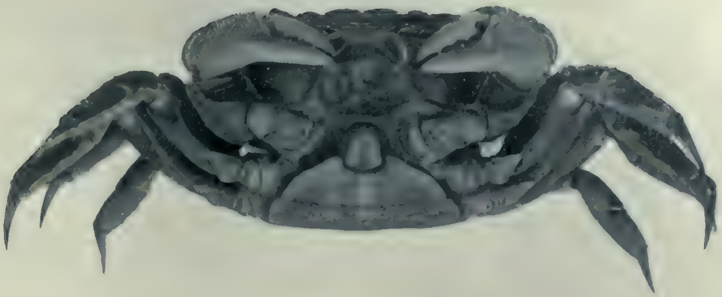
PLATE XLVI

Sarmatium curvatum, A. M. N. H. No. 3284

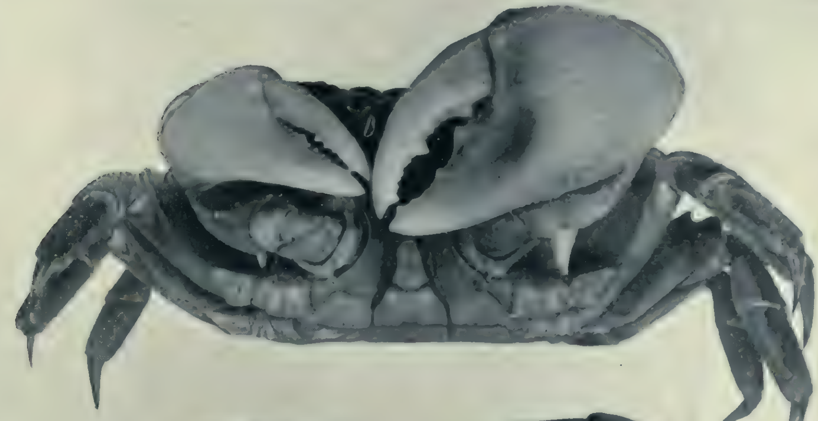
Fig. 1. Female, ventral view.

Fig. 2. Male, ventral view.

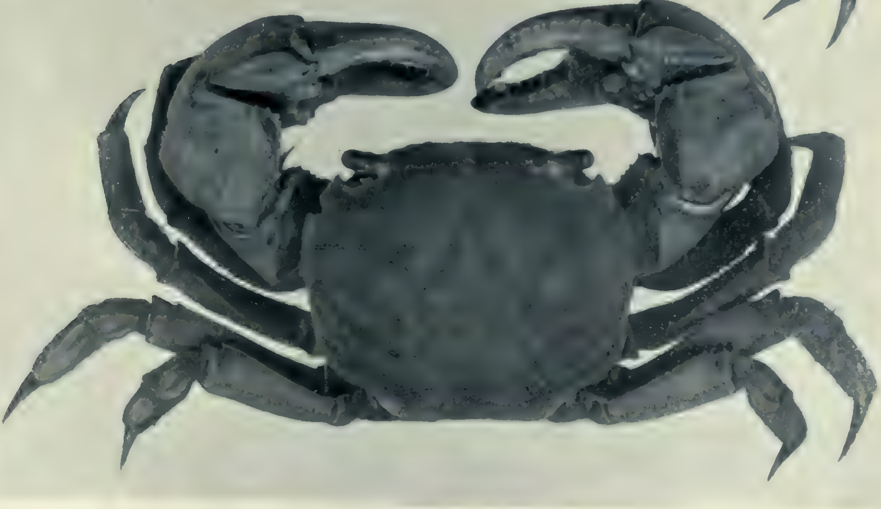
Fig. 3. Male, 36 mm. wide, dorsal view.



1



2



3

PLATE XLVII

Fig. 1. *Sarmatium curvatum*, male, 36 mm. wide, A. M. N. H. No. 3284, front view.

Figs. 2–4. *Cyclograpsus occidentalis*, A. M. N. H. No. 3276.

Fig. 2. Female, ventral view.

Fig. 3. Male, ventral view.

Fig. 4. Another male, 13.2 mm. wide, dorsal view.

Figs. 5–9. *Sesarma* (*Holometopus*) *büttikoferi*, A. M. N. H. No. 3277.

Fig. 5. Male, dorsal view.

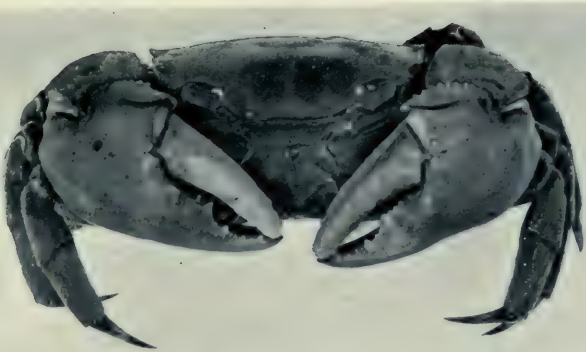
Fig. 6. Another male, ventral view.

Fig. 7. Still another male, front view.

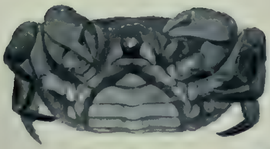
Fig. 8. Female, ventral view.

Fig. 9. Female, dorsal view.

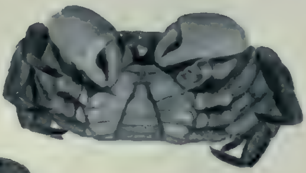
1



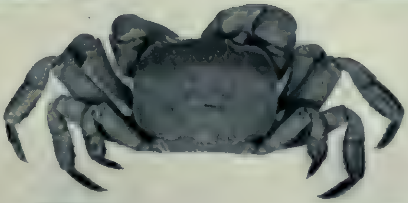
2



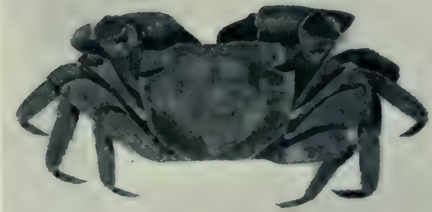
3



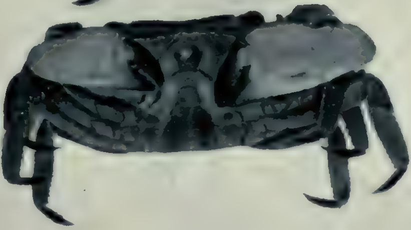
4



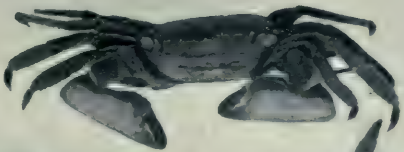
5



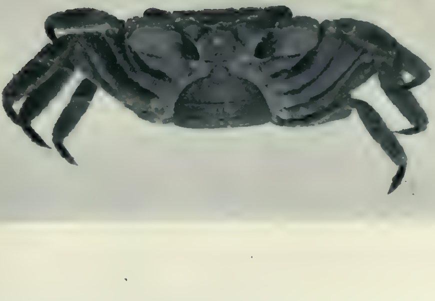
6



7



8



9

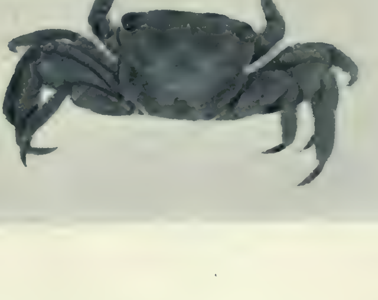
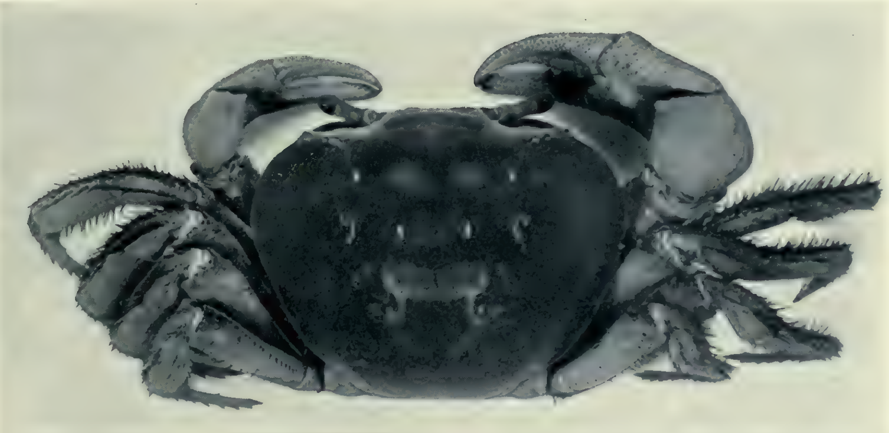


PLATE XLVIII

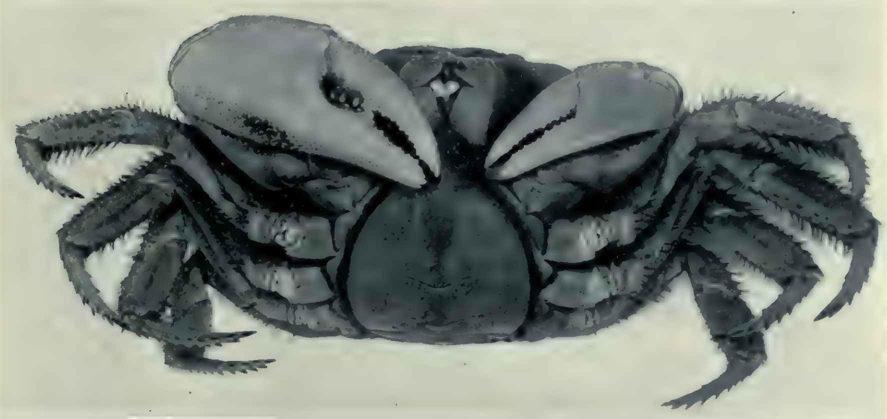
Fig. 1. *Cardisoma armatum*, female, 95.6 mm. wide, A. M. N. H. No. 3273, dorsal view.

Fig. 2. Same specimen, ventral view.

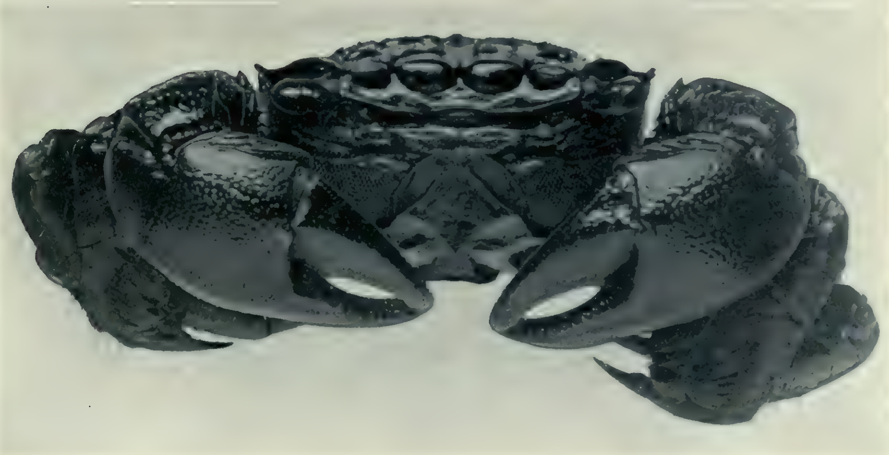
Fig. 3. *Sesarma (Chiromantes) alberti*, male holotype, 34.3 mm. wide, front view.



1



2



3

PLATE XLIX

Cardisoma armatum; male, 117 mm. wide, A. M. N. H. No. 3273, dorsal view.

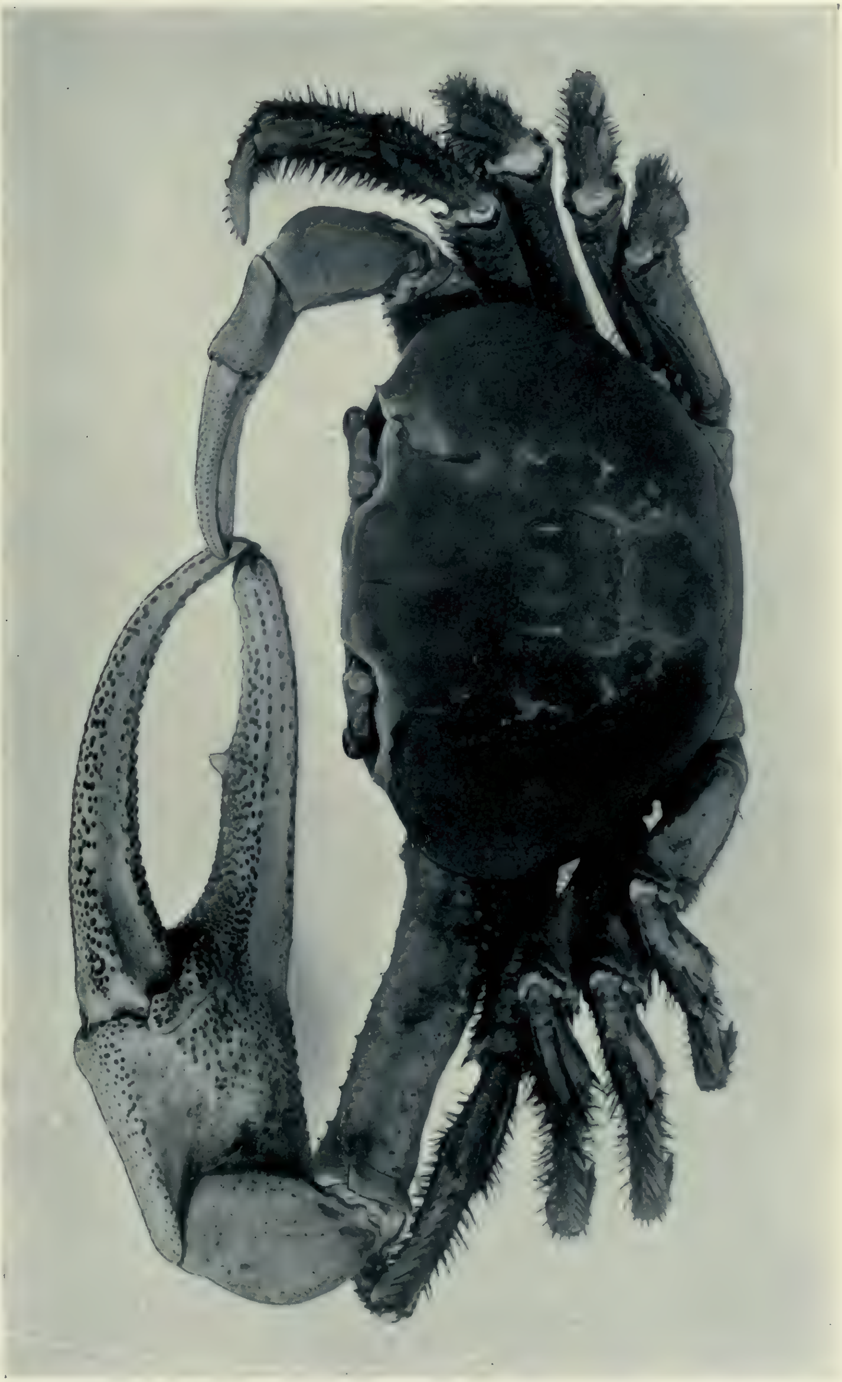


Plate L

Cardisoma armatum, same specimen as Pl. XLIX, ventral view.

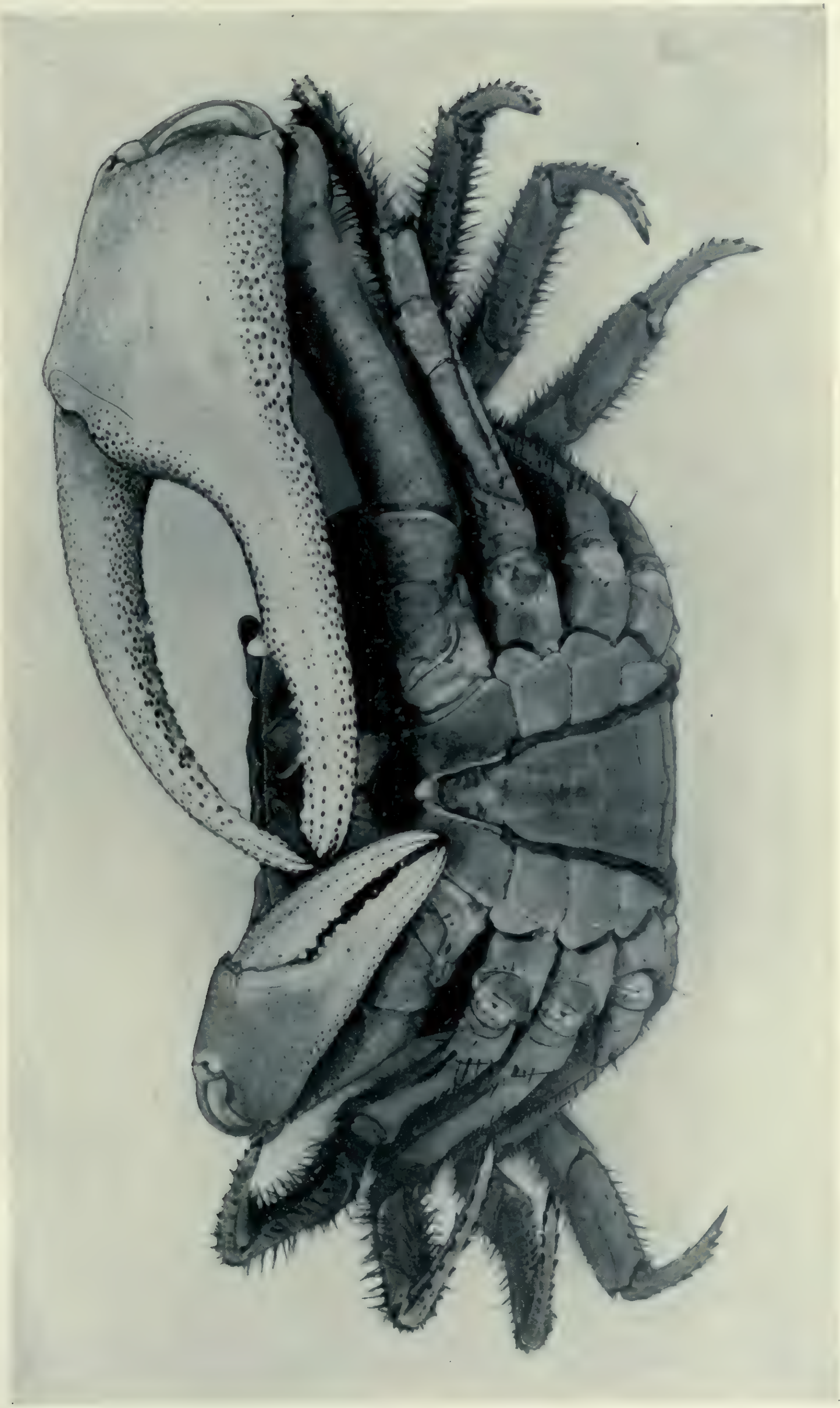


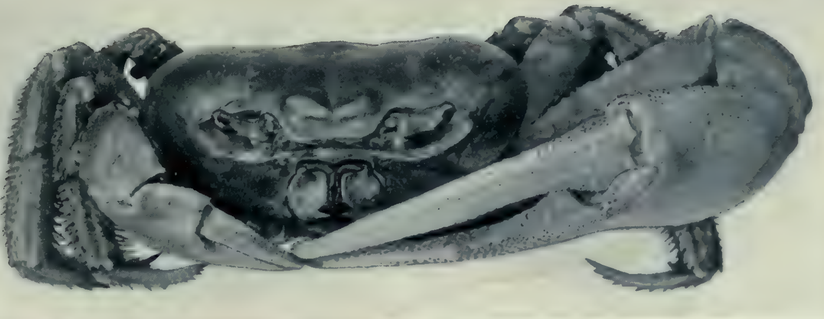
PLATE LI

Cardisoma armatum

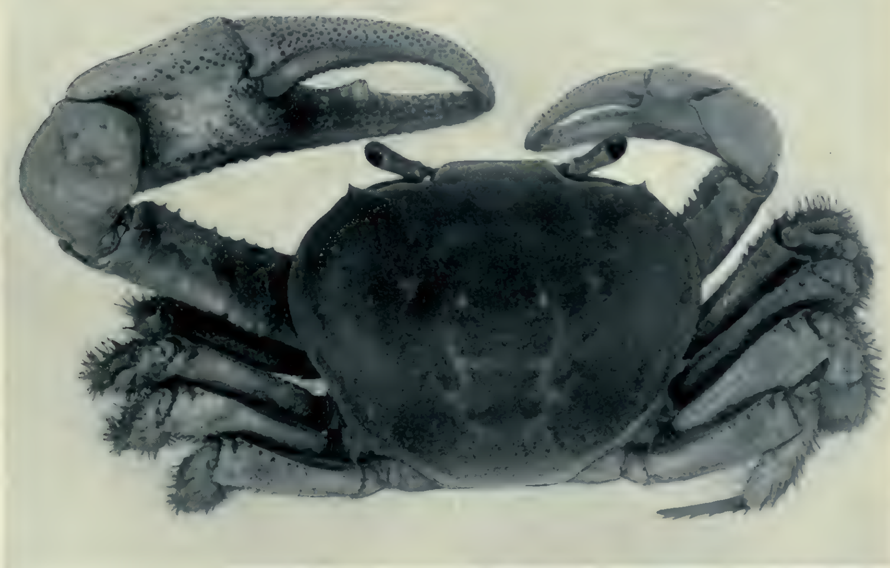
Fig. 1. Same specimen as Pl. XLIX, front view.

Fig. 2. Male, 88 mm. wide, A. M. N. H. No. 3273, dorsal view.

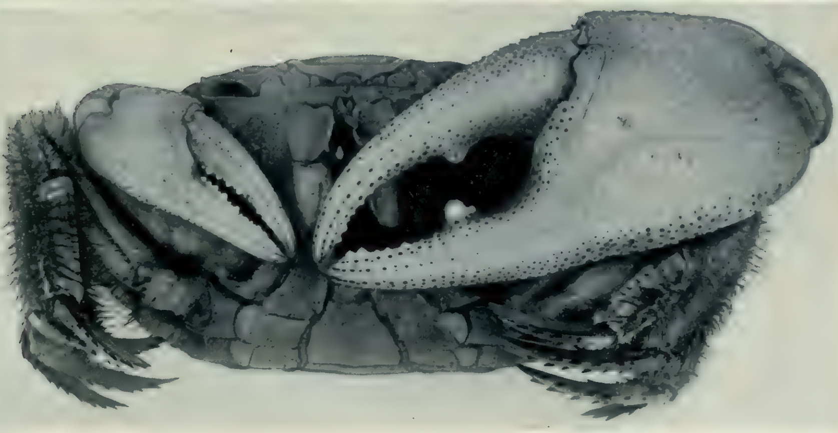
Fig. 3. Same as Fig. 2, ventral view.



1



2



3

PLATE LII

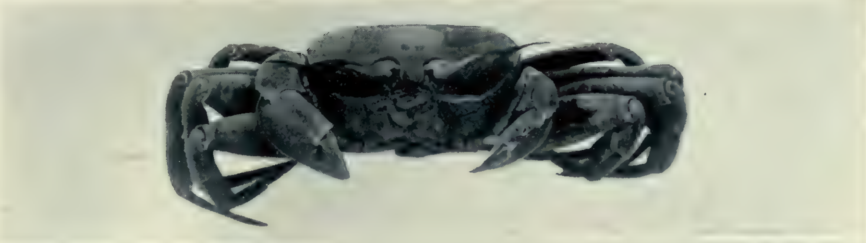
Ocypode ippeus

Fig. 1. Male, 33 mm. wide, A. M. N. H. No. 3080, front view.

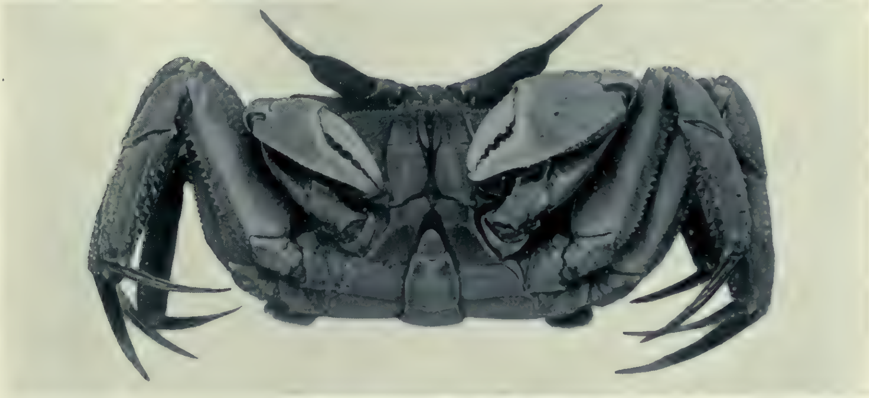
Fig. 2. A larger male, same No., ventral view.

Fig. 3. Another male, A. M. N. H. No. 3087, dorsal view.

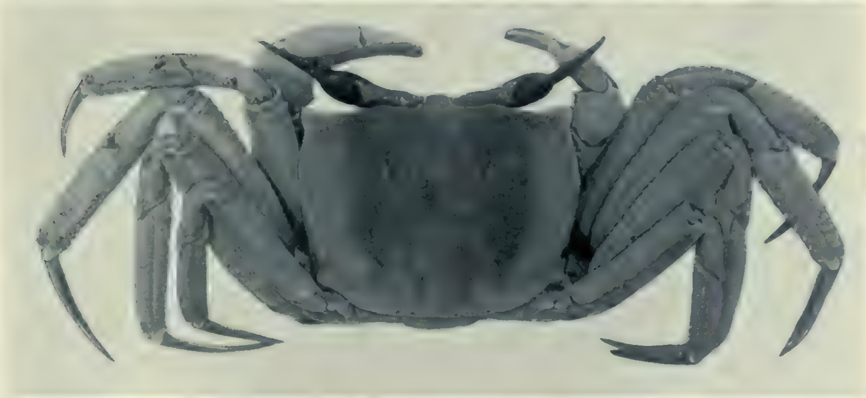
Fig. 4. Female, 41 mm. wide, dorsal view.



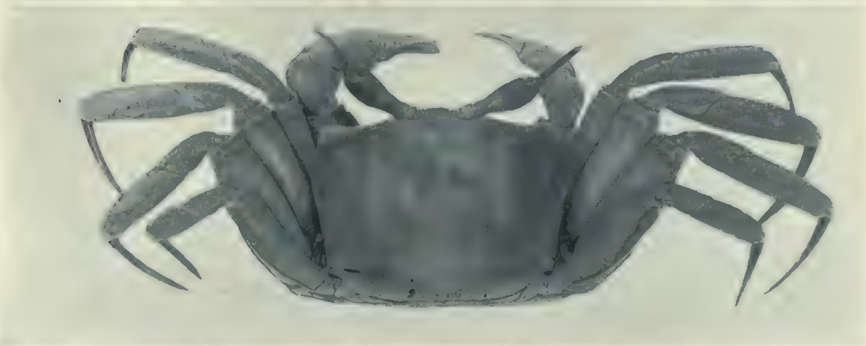
1



2



3



4

PLATE LIII

Ocypode africana, A. M. N. H. No. 3282

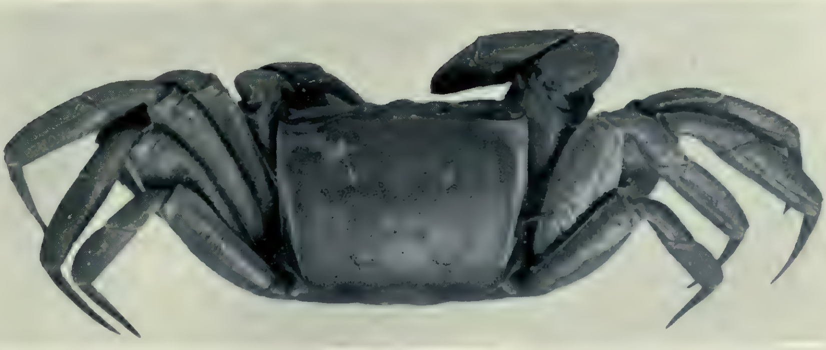
Fig. 1. Male, 29 mm. wide, dorsal view.

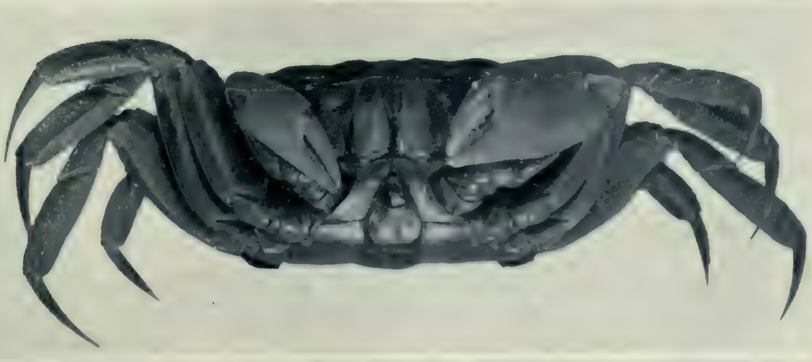
Fig. 2. Another male, ventral view.

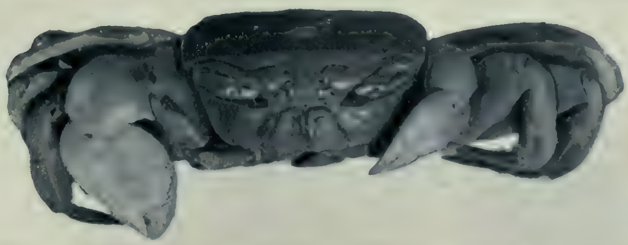
Fig. 3. Still another male, front view.

Fig. 4. Female, dorsal view.

All figures to same scale.


1


2


3

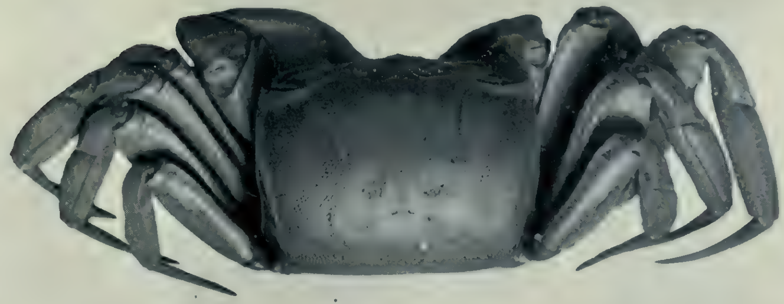

4

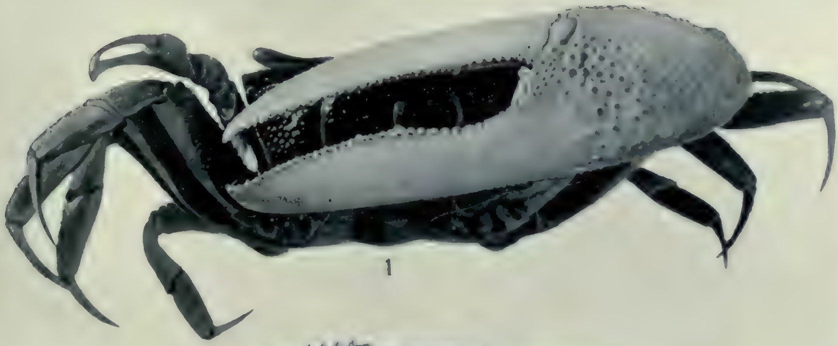
PLATE LIV

Uca tangeri, male, 31.3 mm. wide, U. S. N. M. No. 14874

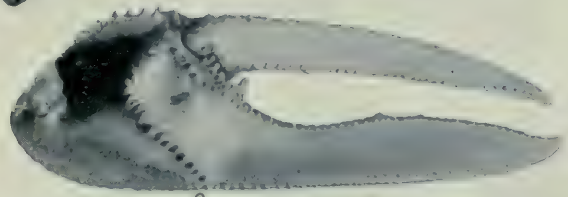
Fig. 1. Front view.

Fig. 2. Inner face of major chela.

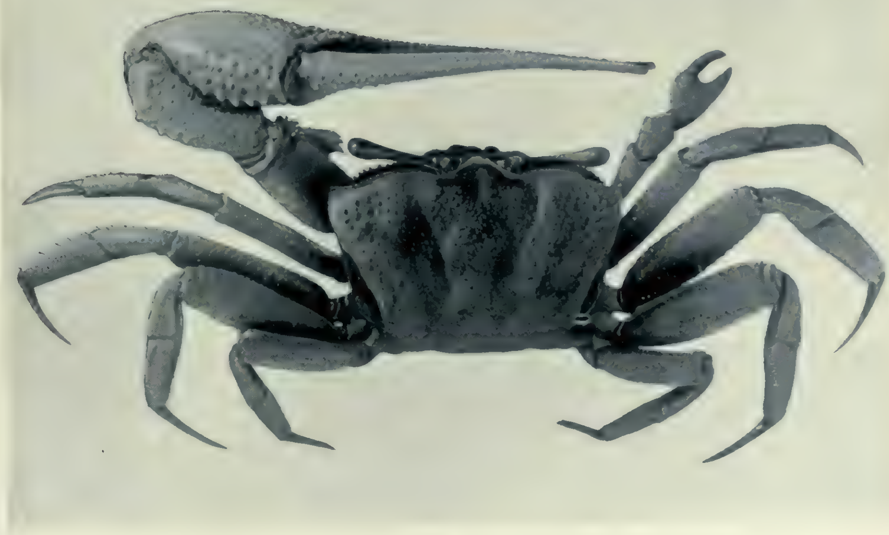
Fig. 3. Dorsal view.



1



2



3

PLATE LV

Fig. 1. Shore of the Atlantic Ocean near the mouth of the Congo along the sandy peninsula which shelters San Antonio from the inroads of the high surf.

"On both sides of the estuary, the wave-swept portions are much alike, varying chiefly in details due to the more or less furious onslaught of the breakers. True dunes are unknown in this part of West Africa, and typical savannah formation reaches out to the very edge of the slope bordering the sea. Along the Angolan coast, dense groves of false Borassus (*Hyphæne guineensis* Schumacher and Thonning) greatly enhance the pictorial effect and clusters of *Sansevieria* are not rare among the thorny shrub and fine grass. On the Belgian side, ecological conditions in the vicinity of the ocean are evidently less favorable for *Hyphæne* which appear scattered and only near Zambi become more numerous.

"The two levels on the higher part of the steep beach, which sometimes varies in width, mark the limit of the ordinary high tide and that of the equinoxes. All along this shore the encroachment of the sea has been continuous in more recent years. As a result of the constantly shifting conditions, but little drift accumulates and very few of the halophilous plants can secure a foothold, though even here a few shoots of the wild sweet potato (*Ipomœa pes-capræ* Roth) have crept over the edge of the slope.

"Such shores are the favorite haunts of sand crabs (*Ocypode ippeus* and *O. africana*)." (H. L.)

Fig. 2. Sandy cove along a bay on the left bank of the estuary of the Congo near San Antonio, at low tide.

"Formerly a great mangrove forest (*Rhizophora Mangle* Linnæus) flourished here, as is proved by the presence of many huge stumps and decaying roots. Part of an immense prop-root of the remains of a gigantic tree is seen to the left and in the background still thrives a fine growth. As the mangroves disappear, the swamps are filled in with sand, and clusters of false date palms (*Phœnix reclinata* Jacquin) here testify to the changed conditions and subsequent consolidation of the ground along the shores of the bay. The tussock of a slender reed-grass near the center is a typical feature of the halophilous vegetation frequently found in sheltered places in the estuary of the Congo.

"In the foreground to the left mangrove prop-roots show a peculiar adaptation by dividing more and more as they near the incoherent particles of sand. The ordinary prop-roots, so efficient in mud, could not secure a hold here, so masses of moss-like rootlets have been formed, which, weighted down by the sand washed up by the tide, admirably answer the purpose of anchoring the trees. These rootlets are responsible for the peat-like formation shown on Plate XVI, fig. 2.

"Here and nearby are the haunts of great colonies of crabs such as *Uca tangeri* and *Sesarma* (*C. africanum*." (H. L.)

1

2

PLATE LVI

Fig. 1. Shore on the east side of Banana peninsula opposite the Dutch trading houses, at the incoming tide.

"The rough embankment of loose stones was made long ago to protect part of the sandy beach along the mouth of Banana Creek from inroads of the waves. This rocky, highly brackish environment has attracted a relatively rich fauna of certain mollusks, worms, and crustaceans. Of the latter, some gregarious isopods (*Ligyda exotica* and *L. olfersii*) love to scurry over the rocks; in the interstices *Grapsus grapsus* occasionally seeks refuge and *Geograpsus lividus* and *Pachygrapsus gracilis* are more common; *Goniopsis cruentata* is well represented near the mangroves; *Panopeus africanus*, often associated with a shrimp, occurs in the more frequently inundated portions, and farther seaward *Callinectes latimanus* may be stirred up from the sand. Even *Uca tangeri* has colonies beyond the mangroves, which, on account of the high salinity of the water, are here the only shore vegetation and remain stunted bushes. The cocoanut-palms in the background are a rather recent introduction." (H. L.)

Fig. 2. Shore vegetation along a bay north of San Antonio at low tide, at the point where sand and mud struggle for the upper hand.

"In such sites, as well as in places where strong currents must be resisted, real stockades of prop-roots are formed by the mangroves (*Rhizophora Mangle* Linnæus). Towards the right, a few heavy stilts support the long, spiny blades of bunches of a stunted *Pandanus*. The palms and other trees in the background are *Phœnix reclinata* Jacquin and *Avicennia africana* Palisot de Beauvois respectively; their presence indicates firmer soil. Such sandy places at low tide are the ideal feeding grounds of fiddler crabs (*Uca tangeri*), whose numerous burrows are practically inaccessible to the collector, being tunneled among the mass of stilt-roots." (H. L.)

1

2

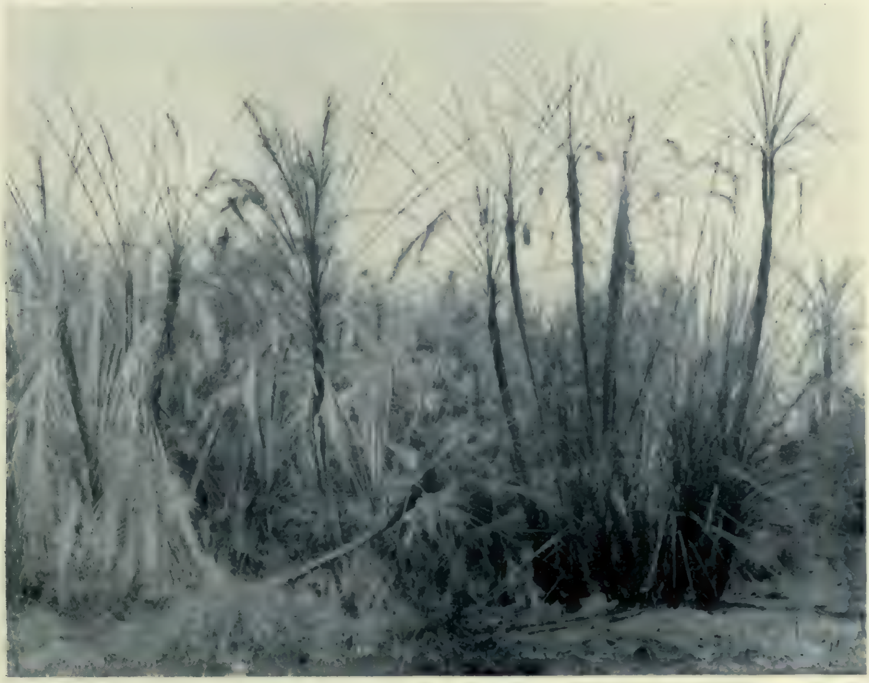
Plate LVII

Fig. 1. Wild date palms (*Phœnix reclinata* Jacquin) a few miles north of Banana after a grass fire had consumed most of their fronds and scorched the trunks.

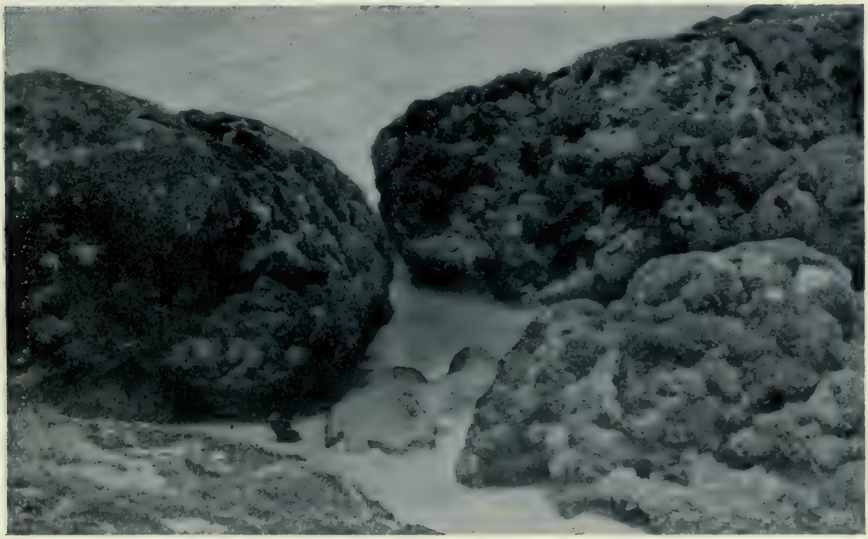
"Bunches of ripe fruits (in August) dangle from the tops of several trees at the right center. Groves of these palms are common across Africa and always indicate ground-water at a slight depth. They are especially numerous on Banana peninsula and in the neighboring savannah Such sites near the coast are the favored haunts of the great land crabs (*Cardisoma armatum*), whose extensive burrows are established among the roots below the scorching hot surface sand and lead down to the water-level, near which the crabs rest." (H. L.)

Fig. 2. Laterite blocks on the beach of the Atlantic near Moanda at the lowest equinoctial tides.

"At the foot of the cliff, just below the lighthouse, extends a real boulder field, which is remarkably rich in marine animals not found near Banana nor along the sandy beach extending from the mouth of the Congo northward. Tiny mussels cover a great portion of the rocks like cushions of heavy moss. Numerous shells and even a few sea-anemones find a suitable environment on some of these boulders, which at normal times are constantly lashed by the incoming surf. A number of crabs which are extremely difficult to gather, such as *Grapsus grapsus*, seek shelter here beneath the rocks, in their cavities, and about the tide-pools; *Geograpsus lividus* occurs nearer the beach." (H. L.)



1



2

PLATE LVIII

Forest of mangroves (*Rhizophora Mangle* Linnæus) bordering a creek near Malela, at high tide.

"Such sites, especially at some distance from the shore, are the homes of *Sesarma* (*H.*) *elegans*, *S.* (*H.*) *büttikoferi*, *S.* (*C.*) *alberti*, *Sarmatium curvatum*, and even *Cardisoma armatum*. The thick outer fringe of foliage generally gives the impression of a continuously dense growth; but the photograph on Plate LIX, the interior view of the same site, shows the open formation in such forests. The rope-like, aërial roots are a characteristic feature and often dangle in masses from branches or trunks from a height of over forty feet. Near the water, or far above, they branch out in the manner of prop-roots, but, not always being anchored, they offer no support to the trees and are swayed back and forth by the wind and currents. Their function is also partly physiological, since they act as supplementary aërating organs (pneumatophores), the numerous rugosities (lenticels) on the surface of the bark providing for an exchange of gases." (H. L.)

PLATE LIX

The interior of a mangrove forest near Malela, about 12 miles east of Banana, at low tide.

"All the trees seen here are *Rhizophora Mangle* Linnæus. The great swampy areas in the estuary of the Congo on both sides of the main stream are divided by more or less wide creeks into numerous islands. On many of these the mangroves form real forests, and the finer trees attain a height of 75 feet, with straight columnar trunks over two feet in diameter.

"From the outside, a fairly dense curtain of foliage allows only a faint view of the interior, which is comparatively open. Progress, however, is rendered difficult by the miry condition of the ground, decaying logs, and the maze of prop-roots. By means of the latter the trees are solidly anchored into the muddy substratum, and they also serve as pneumatophores. In the foreground, mangrove seedlings, after dropping from the branches, have developed shoots with a few leaves. The holes in the fallen trunk are due to devastations by ship-worms (*Teredo navalis*) during the high water-level in the rainy season. To the right, many aërial roots from higher branches are evident.

"Among the crabs found here *Sarmatium curvatum* and *Sesarma* (*C.*) *alberti* are most numerous, with a few stray specimens of *S.* (*H.*) *büttikoferi;* in the drier places the young of *Cardisoma armatum* are also present.

"Relative sizes may be judged by comparison with the negro standing near the center. This is the inside view of the mangrove swamp shown on Plate LVIII." (H. L.)

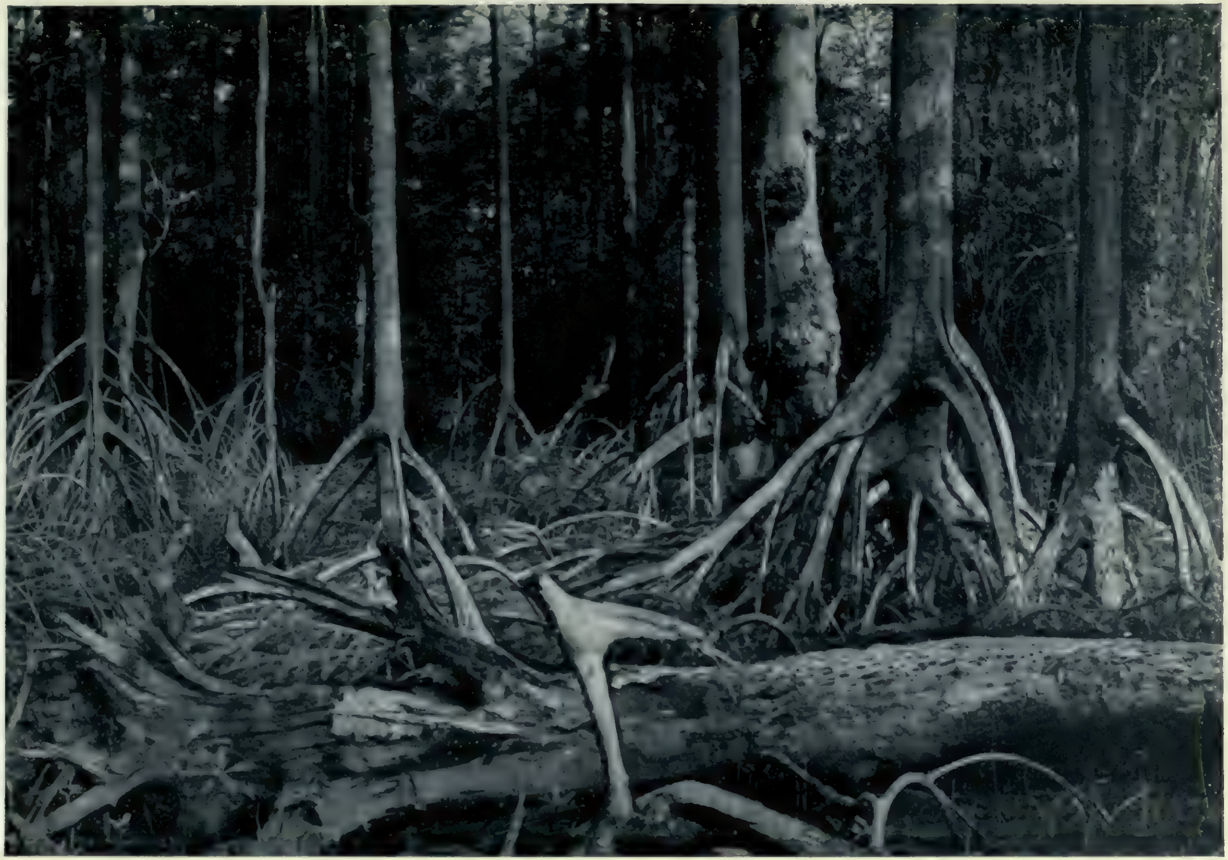


Plate LX

Fig. 1. Forest of mangroves (*Rhizophora Mangle* Linnæus) bordered by *Raphia* palms (probably *Raphia vinifera* Palisot de Beauvois) near Malela, about ten miles east of Banana, at incoming tide.

"The somber green walls of the mangrove forest extend for considerable distances along the narrow and gloomy creeks. Here and there the monotony of the scenery is relieved by low, impenetrable fringes of *Raphia* palms and thick clusters of long leaved screw-pines (*Pandanus*) on heavy stilt-roots.

"In such muddy sites the stem of the *Raphia* remains short and stocky, the often dwarfed leaves practically emerging from the ground. On flat, more continually inundated shores, as near Malela, these palms show a remarkable adaptation to environmental conditions; their dense mass of blackish roots, exposed by the waves, send numerous vertical shoots above the water which serve as aërating roots (pneumatophores). Under favorable conditions the palms often overgrow large tracts, and the midribs then attain a length of fifteen feet or more.

"These sites are inhabited, according to their location, by the same species as are found living in landscapes pictured on Plates LVIII, LIX, and LXI." (H. L.)

Fig. 2. The edge of bushy mangrove formation along Banana Creek at low tide.

"In many sites in the estuary of the Congo flooded by highly brackish water, mangrove ferns (*Acrostichum aureum* Linnæus), like those conspicuous near the foreground, flourish in rather continuous thickets or occur in scattered clusters. Usually their big, rough rhizomes are imbedded in the mud to a slight depth, or they creep along the surface among the maze of prop-roots. The bushes in the background are *Avicennia africana* Palisot de Beauvois, which sends out, often to some distance, many slender, dark shoots, like those in the foreground. These are supplementary aërating roots, negatively geotropic and emerge from the soil much as the shoots of asparagus do.

"The numerous holes in the foreground are entrances to burrows of a species of fiddler crab (*Uca tangeri*), illustrating one of its various habitats." (H. L.)

1

2

PLATE LXI

Bank of the Congo at low tide about 17 miles from Banana, between Malela and Ponta da Lenha.

"In the background the tall bushes mark the farthest up-stream occurrence of mangroves (*Rhizophora Mangle* Linnæus), swamps of which on the Angolan shore extend about three miles farther east. In this zone the salinity of the water is evidently too slight to allow the development of real mangrove forests as in the vicinity of Malela. To the left a patch of stunted papyrus (*Cyperus Papyrus* Linnæus) also demonstrates dwarfed growth as a result of unfavorable environment. In the right foreground an uprooted tussock of reeds has been stranded on the sand flat; its root stock has been completely honeycombed by the burrows of *Sesarma* (*Holometopus*) *angolense*. It is probable that such drifting 'rafts' contribute to the distribution of these crabs. In the swamps farther in-shore may be found *S.* (*Chiromantes*) *alberti*, *S.* (*H.*) *büttikoferi* and *S.* (*H.*) *elegans*." (H. L.)

Plate LXII

Bank of the Congo just below Malela at outgoing tide.

"Like a promontory, reaching out into the river, a great thicket of screw-pines (*Pandanus*) has conquered and maintained its place against all currents and floods. As with mangroves, their heavy stilt roots oppose the encroachment of the water, and, once established, they form an impenetrable jungle; the edges and midribs of the long, thick leaves being serrated by curved spiny teeth. Here the masses of drift that are constantly piling up along the shore often carry with them many crabs (*Sesarma* (*C.*) *alberti*, *S.* (*H.*) *buttikoferi*. *S.* (*H.*) *elegans*, and *Sarmatium curvatum*), most of which soon make their way into the neighboring mangrove swamps, here represented by a single tree. The few oil palms (*Elæis guineensis* Jacquin) shown are part of a fairly extensive grove that was able to flourish beyond the reach of high tides; they probably mark the former site of a native village.

"At the extreme left, the distant bank of the wide creek shows the typical aspect of mangrove forests in the estuary of the Congo, which are often fringed with a luxuriant growth of *Raphia* palms." (H. L.)

PLATE LXIII

Tshopo River near Stanleyville at low water in March.

"The crest of the well-known falls is here seen from behind. In the distance the sandflats give the appearance of a lake-like expanse, which at high water serves to temper the rush of the foaming floods.

"In so densely inhabited a region one must expect to find that primeval woods have long since been succeeded by secondary forest, as shown on the shore beyond. In many inundated portions along the banks the characteristically impenetrable aspect is evident. The rocks are often covered with a peculiar alga or moss-like growth of Podostemaceæ. Constant moisture in the form of spray carried by the wind has engendered a tropical luxuriance to the far side of the falls.

"Here in the shallows, swamps, boulder-fields and neighboring brooks a systematic search for crabs gave excellent results, one species collected, *Potamon* (*Geothelphusa*) *perparvus*, proving new to science, and others of this genus being common." (H. L.)

PLATE LXIV

Forest brook in the Rain Forest of the northeastern Belgian Congo south of Poko, at the end of January.

"In such low-lying parts of the forest, moisture fosters an excessive luxuriance, which is most noticeable in the greater density of the foliage. Typical features are the mass of creepers, ferns, marantaceous reeds, mosses and liverworts.

"In all the hilly, undulating regions where the headwaters of the Congo slowly gain in volume, the many, clear, meandering streamlets are the habitat of *Potamon* (*Potamonautes*) *floweri*, *P.* (*P.*) *dybowskii*, and *P.* (*Geothelphusa*) *congoënsis*. The torrential rush of the roiled floods after every freshet clears the beds of these brooks or chokes them with still greater masses of débris. The crabs and other creatures are thus constantly shifted. The marble-white sand in the shallow parts is generally avoided by all species of *Potamon*, but dead branches, leaves, and quiet pools beneath overhanging vegetation attract *P.* (*G.*) *congoënsis* and *P.* (*P.*) *floweri*, whereas the moss-grown stones and the neighborhood of rapids are favored by *P.* (*P.*) *dybowskii*.

"On the northern and southern edge of the Rain Forest a dry period of over two months may cause the forest brooklets to dwindle somewhat, thus concentrating their fauna, so that crabs can be more easily found At low water is the opportune time for some of these creatures to invade the larger streams, which, in spite of the absence of definite dry and rainy seasons near the equator, have their periods of fluctuation. Numerous inlets of adjoining brooks and swamps aid the wide distribution of these crabs." (H. L.)

INDEX

New names of species are printed in **heavy-faced type**, also the main references in a series of references; synonyms are printed in *italics*.

abbreviatus, Eurypanopeus, 441.
Acanthothelphusa, 385, 386, 406, **427.**
Acrostichum aureum, Pl. LX, Fig. 2.
africana, Avicennia, Pl. LVI, Fig. 2; Pl. LX, Fig. 2.
  Ocypode, 380, 381, 382, **462,** 464, 465. Pl. LIII, Figs. 1–4; Pl. LV, Fig. 1.
  Thalamita, 380, 382, **402,** 403 (Fig. 5). Pl. XXIII, Figs. 1–3.
  Thalamita integra var., 402.
africanum, Sesarma, 380, 381, 392, **446,** 447, 448, 449, 452. Pl. XLI, Figs. 1–4; Pl. XLII, Fig. 2; Pl. LV, Fig. 2.
africanus, Callinectes, 384, 401.
  Callinectes diacanthus var., 384, 395, 399.
  Callinectes larvatus var., 395.
  Eupanopeus, 438.
  Panopeus, 380, 381, 382, **438,** 439 (Fig. 19). Pl. XXXVII, Figs. 1–3; Pl. LVI, Fig. 1.
  Potamon, 386.
alberti, Sesarma, 379, 380, 381, 446, **448,** 452. Pl. XLII, Fig. 1; Pl. XLVIII, Fig. 3; Pl. LVIII; Pl. LIX; Pl. LXI; Pl. LXII.
alluaudi, Deckenia, 434.
aloysii-sabaudiæ, Potamon, 386.
anchietæ, Potamon, 417.
angolense, Sesarma, 380, 381, 382, 446, 447, 449, **451,** 452. Pl. XLIII, Figs. 1–3; Pl. XLV, Fig. 1; Pl. LXI.
ankaraharæ, Potamon, 385.
antongilensis, Potamon, 385.
armatum, Cardiosoma, 456.
  Cardisoma, 380, 381, 384, 392, 455, **456,** 457 (Fig. 21), 458, 459. Pl. XVII, Figs. 1–2; Pl. XLVIII, Figs. 1–2; Pl. XLIX; Pl. L; Pl. LI, Figs. 1–3; Pl. LVII, Fig. 1; Pl. LVIII; Pl. LIX.
atlantica, Dromia, 380, 382, **393** (Fig. 1). Pl. XVIII, Fig. 3.
aubryi, Potamon, 386, 408.
aureum, Acrostichum, Pl. LX, Fig. 2.
Avicennia africana, Pl. LVI, Fig. 2; Pl. LX, Fig. 2.

ballayi, Potamon, 380, 382, 385, 386, 406, **419,** 420 (Fig. 10). Pl. XXVII, Figs. 1–3; Pl. XXVIII, Fig. 1.
  Thelphusa, 419.
blanchardi, Eurypanopeus, 380, 381, **440,** 441 (Fig. 20). Pl. XXXVI, Figs. 2–3.
  Panopeus, 440.
bocourti, Callinectes, 398, 401.
Borassus, 391.
Brachygnatha, 394.
Brachyrhyncha, 394.
Brachyura, 393.
brazzæ, Erimetopus, 380, 381, 386, **433,** 434 (Fig. 15). Pl. XXXIII, Figs. 1–3.
  Parathelphusa, 433.
  Potamon, 433.
  Thelphusa, 433.
büttikoferi, Sesarma, 380, 381, 382, 446, **449,** 452. Pl. XLVII, Figs. 5–9; Pl. LVIII; Pl. LIX; Pl. LXI; Pl. LXII.

Callinectes, 383, 384, **394,** 401, 404.
  africanus, 384, 401.
  bocourti, 398, 401.
  diacanthus, 395.
  diacanthus var. *africanus*, 384, 395, 399.
  gladiator, 380, 381, 384, 394, **397,** 398 (Fig. 3). Pl. XIX, Fig. 2.
  hastatus, 384.

  larvatus, 384, 395.
  larvatus var. *africanus*, 395.
  latimanus, 380, 381, 395, **398**, 399 (Fig. 4), 401. Pl. XV, Fig. 2; Pl. XXI, Figs. 1–3; Pl. XXII, Fig. 1; Pl. LVI, Fig. 1.
  marginatus, 380, 381, 382, 384, **395**, 396 (Fig. 2), 397, 400, 401. Pl. XIX, Fig. 1; Pl. XX, Fig. 1.
  sapidus, 384.
  tumidus var. *gladiator*, 397.
campi, Potamon, 386.
Cancer grapsus, 441.
Cardiosoma armatum, 456.
Cardisoma, 384, **456.**
  armatum, 380, 381, 384, 392, 455, **456**, 457 (Fig. 21), 458, 459. Pl. XVII, Figs. 1–2; Pl. XLVIII, Figs. 1–2; Pl. XLIX; Pl. L; Pl. LI, Figs. 1–3; Pl. LVII, Fig. 1; Pl. LVIII; Pl. LIX.
  guanhumi, 384, 456, 457, 458, 459.
  guanhumi, 456.
carinimana, Pisa, 380, 382, 394, **466**, 467 (Fig. 22). Pl. XVIII, Figs. 1–2.
Ceratogymna, 410.
chaperi, *Parathelphusa*, 429.
  Potamon, 385, 429.
chavanesii, Potamon, 386.
Chiromantes, 446.
congoënsis, Potamon, 380, 381, 382, 386, 406, **422**, 423 (Fig. 11), 424, 425, 426, 427. Pl. XXVIII, Fig. 3; Pl. XXIX, Figs. 1–3; Pl. LXIV.
cranchiana, *Lupa*, 384.
cruentata, Goniopsis, 380, 381, 392, **443**, 444, 445. Pl. XXXIX, Figs. 1–3; Pl. LVI, Fig. 1.
cruentatus, *Grapsus*, 443.
Cuma, 453.
curvata, *Sesarma*, 454.
curvatum, Sarmatium, 380, 382, **454**, 455. Pl. XVI, Figs. 1–2; Pl. XLII, Fig. 3; Pl. XLVI, Figs. 1–3; Pl. XLVII, Fig. 1; Pl. LVIII; Pl. LIX; Pl. LXII.
Cyclograpsus, 455.
  occidentalis, 379, 380, 381, **455.** Pl. XLVII, Figs. 2–4.
Cylindrotelphusa, 385.
  macropus, 385.
  perrieri, 385, 386.
Cyperus Papyrus, Pl. LXI.

decazei, Potamon, 386.
Deckenia, 385, **434.**
  alluaudi, 434.
  imitatrix, 434.
  mitis, 380, 381, **434**, 435 (Fig. 16). Pl. XXXIV, Figs. 1–3.
Deckeniinæ, 434.
diacanthus, Callinectes, 395.
diacanthus var. *africanus*, *Callinectes*, 384, 395, 399.
didieri, Potamon, 385, 386, 387, 424, 425.
Dromia, 393.
  atlantica, 380, 382, **393** (Fig. 1). Pl. XVIII, Fig. 3.
Dromiacea, 393.
Dromiidæ, 393.
dybowskii, Potamon, 380, 381, 382, 386, **410**, 411 (Fig. 7), 412, 414, 415, 416, 418. Pl. XXIV, Figs. 1–3; Pl. LXIV.

Elæis guineensis, Pl. LXII.
elegans, Sesarma, 380, 381, 392, 446, 452, **453.** Pl. XLIV, Figs. 1–3; Pl. XLV, Fig. 2; Pl. LVIII; Pl. LXI; Pl. LXII.
emini, Potamon, 386, 424, 426, 427.
  Telphusa, 424.
Erimetopus, 385, **433.**
  brazzæ, 380, 381, 386, **433**, 434 (Fig. 15). Pl. XXXIII, Figs. 1–3.
  spinosus, 433.
Eupanopeus africanus, 438.
Eurypanopeus, 440.
  abbreviatus, 441.
  blanchardi, 380, 381, **440**, 441 (Fig. 20). Pl. XXXVI, Figs. 2–3.
  parvulus, 440, 441.
exotica, Ligyda, Pl. LVI, Fig. 1.

faradjensis, Potamon, 380, 381, 382, 386, **428** (Fig. 13). Pl. XXXI, Figs.

1–3.
floweri, Potamon, 380, 381, 382, 386, 387, **406,** 408 (Fig. 6), 409. Pl. XX, Fig. 2; Pl. LXIV.
fruhstorferi, Potamon, 385.
furcata, Upogebia, Pl. XVI, Fig. 2.

Gecarcinucinæ, 385, 386, 407.
Gelasimus tangeri, 465.
Geograpsus, 442.
  lividus, 379, 380, 381, **442.** Pl. XV, Fig. 1; Pl. XXII, Figs. 2–3; Pl. LVI, Fig. 1; Pl. LVII, Fig. 2.
Geothelphusa, 385, 386, 405, **422.**
gladiator, Callinectes, 380, 381, 384, 394, **397,** 398 (Fig. 3). Pl. XIX, Fig. 2.
  Callinectes tumidus var., 397.
Goniopsis, 443.
  cruentata, 380, 381, 392, **443,** 444, 445. Pl. XXXIX, Figs. 1–3; Pl. LVI, Fig. 1.
gracilis, Metopograpsus, 445.
  Pachygrapsus, 379, 380, 381, **445.** Pl. XL, Fig. 1; Pl. LVI, Fig. 1.
Grapsidæ, 441.
Grapsus, 441.
  cruentatus, 443.
  grapsus, 380, 381, 392, **441,** 442. Pl. XXXVIII, Figs. 1–3; Pl. LVI, Fig. 1; Pl. LVII, Fig. 2.
  lividus, 442.
  transversus, 444.
grapsus, Cancer, 441.
  Grapsus, 380, 381, 392, **441,** 442. Pl. XXXVIII, Figs. 1–3; Pl. LVI, Fig. 1; Pl. LVII, Fig. 2.
guanhumi, Cardisoma, 384, 456, 457, 458, 459.
  Cardisoma, 456.
guineensis, Elæis, Pl. LXII.
  Hyphæne, Pl. LV, Fig. 1.

hastatus, Callinectes, 384.
herbstii, Panopeus, 438.
Holometopus, 449.
Hydrothelphusa, 385.
Hyphæne guineensis, Pl. LV, Fig. 1.

imitatrix, Deckenia, 434.
Inachidæ, 466.
integra, Thalamita, 404.
integra var. *africana, Thalamita*, 402.
Ipomæa pes-capræ, Pl. LV, Fig. 1.
ippeus, Ocypode, 380, 381, 382, **461,** 462, 464, 465. Pl. LII, Figs. 1–4; Pl. LV, Fig. 1.

langi, Potamon, 380, 381, 382, 386, **430,** 432 (Fig. 14). Pl. XXXII, Figs. 1–3.
larvatus, Callinectes, 384, 395.
larvatus var. *africanus, Callinectes*, 395.
latimanus, Callinectes, 380, 381, 395, **398,** 399 (Fig. 4), 401. Pl. XV, Fig. 2; Pl. XXI, Figs. 1–3; Pl. XXII, Fig. 1; Pl. LVI, Fig. 1.
Ligyda exotica, Pl. LVI, Fig. 1.
  olfersii, Pl. LVI, Fig. 1.
lirrangensis, Potamon, 380, 382, 386, **413,** 414 (Fig. 8), 415. Pl. XXV, Figs. 1-3; Pl. XXVI, Fig. 3.
Littorina, 453.
lividus, Geograpsus, 379, 380, 381, **442.** Pl. XV, Fig. 1; Pl. XXII, Figs. 2–3; Pl. LVI, Fig. 1; Pl. LVII, Fig. 2.
  Grapsus, 442.
lueboensis, Potamon, 386.
Lupa, 383.
  cranchiana, 384.
  smythiana, 384, 397.

macropus, Cylindrotelphusa, 385.
madagascariensis, Potamon, 407.
Mangle, Rhizophora, 388, 391. Pl. XVI, Fig. 2; Pl. LV, Fig. 2; Pl. LVI, Fig. 2; Pl. LVIII; Pl. LIX; Pl. LX, Fig. 1; Pl. LXI.
marchei, Potamon, 386.
marginatus, Callinectes, 380, 381, 382, 384, **395,** 396 (Fig. 2), 397, 400, 401. Pl. XIX, Fig. 1; Pl. XX, Fig. 1.
  Neptunus, 395.
marginatus var. *truncatus, Neptunus*, 399.
Melampus, 456.
Menippe, 436.
  nanus, 379, 380, 381, **436** (Fig. 17).

Pl. XXXV, Figs. 1–2.
Metopograpsus gracilis, 445.
mitis, Deckenia, 380, 381, **434,** 435 (Fig. 16). Pl. XXXIV, Figs. 1–3.

nanus, Menippe, 379, 380, 381, **436** (Fig. 17). Pl. XXXV, Figs. 1–2.
navalis, Teredo, Pl. LIX.
Neptunus, 383.
  marginatus, 395.
  marginatus var. *truncata*, 399.
  sanguinolentus, 397.
  sayi, 384.
Neritina, 451.
nigrensis, Potamon, 385.
niloticus, Potamon, 385, 431.
  Varanus, 410.

obesus, Potamon, 406.
occidentalis, Cyclograpsus, 379, 380, 381, **455.** Pl. XLVII, Figs. 2–4.
Ocypode, 392, **461,** 462.
  africana, 380, 381, 382, **462,** 464, 465. Pl. LIII, Figs. 1–4; Pl. LV, Fig. 1.
  ippeus, 380, 381, 382, **461,** 462, 464, 465. Pl. LII, Figs. 1–4; Pl. LV, Fig. 1.
Ocypodidæ, 461.
olfersii, Ligyda, Pl. LVI, Fig. 1.
Oxyrhyncha, 466.
Oxystomata, 434.

Pachygrapsus, 444.
  gracilis, 379, 380, 381, **445.** Pl. XL, Fig. 1; Pl. LVI, Fig. 1.
  simplex, 445.
  transversus, 380, 381, 382, **444,** 445. Pl. XL, Figs. 2–3.
pœcilei, Potamon, 386.
Pandanus, 389, 391. Pl. LVI, Fig. 2; Pl. LX, Fig. 1; Pl. LXII.
Panopeus, 438.
  africanus, 380, 381, 382, **438,** 439 (Fig. 19). Pl. XXXVII, Figs. 1–3; Pl. LVI, Fig. 1.
  blanchardi, 440.
  herbstii, 438.
Papyrus, Cyperus, Pl. LXI.
Parasesarma, 449, 451.
Parathelphusa brazzæ, 433.
  chaperi, 429.
parvulus, *Eurypanopeus*, 440, 441.
Periophthalmus, 391.
perlatus, Potamon, 417.
perparvus, Potamon, 380, 382, 386, 406, **425,** 426 (Fig. 12), 427. Pl. XXVIII, Fig. 2; Pl. XXX, Figs. 1–3; Pl. LXIII.
perrieri, Cylindrotelphusa, 385, 386.
pes-capræ, Ipomæa, Pl. LV, Fig. 1.
Phœnix, 391, 460, 461.
  reclinata, Pl. LV, Fig. 2; Pl. LVI, Fig. 2; Pl. LVII, Fig. 1.
Pilumnus, 437.
  verrucosipes, 380, 382, **437** (Fig. 18). Pl. XXXV, Fig. 3; Pl. XXXVI, Fig. 1.
Pinna, 394, 467, 468.
Pisa, 466.
  carinimana, 380, 382, 394, **466,** 467 (Fig. 22). Pl. XVIII, Figs. 1–2.
Platythelphusa, 385.
pobeguini, Potamon, 386.
Podostemaceæ, Pl. LXIII.
Portunidæ, 394.
Portunus sayi, 384.
Potamides, 390, 448.
Potamogale velox, 410.
Potamon, 385, 386, **405,** 406, **418,** 427, 433. Pl. LXIV.
  africanus, 386.
  aloysii-sabaudiæ, 386.
  anchietæ, 417.
  ankaraharæ, 385.
  antongilensis, 385.
  aubryi, 386, 408.
  ballayi, 380, 382, 385, 386, 406, **419,** 420 (Fig. 10). Pl. XXVII, Figs. 1–3; Pl. XXVIII, Fig. 1.
  brazzæ, 433.
  campi, 386.
  chaperi, 385, 429.
  chavanesii, 386.
  congoënsis, 380, 381, 382, 386, 406, **422,** 423 (Fig. 11), 424, 425, 426, 427. Pl. XXVIII, Fig. 3; Pl.

XXIX, Figs. 1–3; Pl. LXIV.
  decazei, 386.
  didieri, 385, 386, 387, 424, 425.
  dybowskii, 380, 381, 382, 386, **410,** 411 (Fig. 7), 412, 414, 415, 416, 418. Pl. XXIV, Figs. 1–3; Pl. LXIV.
  emini, 386, 424, 426, 427.
  faradjensis, 380, 381, 382, 386, **428** (Fig. 13). Pl. XXXI, Figs. 1–3.
  floweri, 380, 381, 382, 386, 387, **406,** 408 (Fig. 6), 409. Pl. XX, Fig. 2; Pl. LXIV.
  fruhstorferi, 385.
  langi, 380, 381, 382, 386, **430,** 432 (Fig. 14). Pl. XXXII, Figs. 1–3.
  lirrangensis, 380, 382, 386, **413,** 414 (Fig. 8), 415. Pl. XXV, Figs. 1–3; Pl. XXVI, Fig. 3.
  lueboensis, 386.
  madagascariensis, 407.
  marchei, 386.
  nigrensis, 385.
  niloticus, 385, 431.
  obesus, 406.
  pæcilei, 386.
  perlatus, 417.
  perparvus, 380, 382, 386, 406, **425,** 426 (Fig. 12), 427. Pl. XXVIII, Fig. 2; Pl. XXX, Figs. 1–3; Pl. LXIII.
  pobeguini, 386.
  regnieri, 386.
  schubotzi, 386.
  stanleyensis, 380, 381, 382, 386, 411, **415,** 416 (Fig. 9). Pl. XXVI, Figs. 1–2.
Potamonautes, 385, 386, 405, **406,** 427.
Potamonidæ, 379, 384, 385, 386, **404,** 434.
Potamoninæ, 386, **404.**
Pseudothelphusinæ, 434.

Raphia, 389, 391. Pl. LXII.
  vinifera, Pl. LX, Fig. 1.
reclinata, Phœnix, Pl. LV, Fig. 2; Pl. LVI, Fig. 2; Pl. LVII, Fig. 1.
regnieri, Potamon, 386.
Rhizophora Mangle, 388, 391. Pl. XVI, Fig. 2; Pl. LV, Fig. 2; Pl. LVI, Fig. 2; Pl. LVIII; Pl. LIX; Pl. LX, Fig. 1; Pl. LXI.

sanguinolentus, Neptunus, 397.
Sansevieria, 391. Pl. LV, Fig. 1.
sapidus, Callinectes, 384.
Sarmatium, 454.
  curvatum, 380, 382, **454,** 455. Pl. XVI, Figs. 1–2; Pl. XLII, Fig. 3; Pl. XLVI, Figs. 1–3; Pl. XLVII, Fig. 1; Pl. LVIII; Pl. LIX; Pl. LXII.
sayi, Neptunus, 384.
  Portunus, 384.
schubotzi, Potamon, 386.
Sesarma, 379, **446.**
  africanum, 380, 381, 392, **446,** 447, 448, 449, 452. Pl. XLI, Figs. 1–4; Pl. XLII, Fig. 2; Pl. LV, Fig 2.
  alberti, 379, 380, 381, 446, **448,** 452, Pl. XLII, Fig. 1; Pl. XLVIII. Fig. 3; Pl. LVIII; Pl. LIX; Pl. LXI; Pl. LXII.
  angolense, 380, 381, 382, 446, 447, 449, **451,** 452. Pl. XLIII, Figs. 1–3; Pl. XLV, Fig. 1; Pl. LXI.
  büttikoferi, 380, 381, 382, 446, **449,** 452. Pl. XLVII, Figs. 5–9; Pl. LVIII; Pl. LIX; Pl. LXI; Pl. LXII.
  curvata, 454.
  elegans, 380, 381, 392, 446, 452, **453.** Pl. XLIV, Figs. 1–3; Pl. XLV, Fig. 2; Pl. LVIII; Pl. LXI; Pl. LXII.
  violacea, 454.
Sesarminæ, 446.
simplex, Pachygrapsus, 445.
smythiana, Lupa, 384, 397.
spinosus, Erimetopus, 433.
stanleyensis, Potamon, 380, 381, 382, 386, 411, **415,** 416 (Fig. 9). Pl. XXVI, Figs. 1–2.

tangeri, Gelasimus, 465.
  Uca, 380, 381, 382, **465.** Pl. XLV, Figs. 3–4; Pl. LIV, Figs. 1–3; Pl. LV, Fig. 2; Pl. LVI, Figs. 1–2; Pl.

LX, Fig. 2.
Telphusa emini, 424.
Teredo navalis, Pl. LIX.
Thalamita, 402.
  africana, 380, 382, **402,** 403 (Fig. 5). Pl. XXIII, Figs. 1–3.
  integra, 404.
  integra var. *africana*, 402.
Thelphusa ballayi, 419.
  brazzæ, 433.
transversus, Grapsus, 444.
  Pachygrapsus, 380, 381, 382, **444,** 445. Pl. XL, Figs. 2–3.
truncata, Neptunus marginatus var., 399.
tumidus var. *gladiator, Callinectes*, 397.
Uca, 465.
  tangeri, 380, 381, 382, **465.** Pl. XLV, Figs. 3–4; Pl. LIV, Figs. 1–3; Pl. LV, Fig. 2; Pl. LVI, Figs. 1–2; Pl. LX, Fig. 2.
Upogebia furcata, Pl. XVI, Fig. 2.

Varanus niloticus, 410.
velox, Potamogale, 410.
verrucosipes, Pilumnus, 380, 382, **437** (Fig. 18). Pl. XXXV, Fig. 3; Pl. XXXVI, Fig. 1.
vinifera, Raphia, Pl. LX, Fig. 1.
violacea, Sesarma, 454.

Xanthidæ, 436.

INDEX TO VOLUME XLIII

(Articles I, II, III, IV, V, and VII[1])

New names of genera, species, and subspecies are printed in **heavy-faced type**, also the main reference in a series of references; synonyms are printed in *italics*.

abdominalis, Tipula, 18.
abyssinicus, Palpares, **22,** 25.
aculeata, Cubaris, 45.
aculeatus, Armadillo, 45.
  Diploexochus, 45.
acuminata, Nerocila, 59.
acutus, Banyutus, 28.
Adelphomyia, 10.
Ægа, 43.
  deshayesiana, 43.
  webbii, 43.
ægrotus, Palpares, 25, 26.
Æthaloptera, **31,** 33.
  dispar, **31,** 33.
africana, Creagris, **24,** 27.
  Dipseudopsis, 32.
  Lecteria, 11, **14,** 15. Pl. IV, fig. 2.
  Neoperla, 36.
africanus, Argulus, 1, 4.
  Myrmeleon, 24.
alberti, Tmesibasis, 29.
albicorne, Eubelum, 44.
albicornis, Mesarmadillo, 44.
albinotatus, Synarmadillo, 44.
albomaculata, Hydropsychodes, 33.
albopunctata, Setodellina, 33.
albovittatus, Ctenacroscelis, 18.
alcidice, Neuroleon, 28.
Allocormodes, 29.
  intractabilis, 29.
amblоplites, Argulus, 3. Pl. II, figs. 11–19.
americanus, Argulus, 4.
Amphipoda, 371.
Ampithoë, 378.
Ampithoidæ, 371, **378.**
Anchiphiloscia, 45.
  cunningtoni, 45
Anilocra, 43.
  capensis, 43.
Argulus, 1, **2.**
  africanus, 1, 4.
  amblоplites, 3. Pl. II, figs. 11–19.
  americanus, 4.
  reticulatus, 2. Pl. I, figs. 1–10.
Armadillo, 45, 97.
  aculeatus, 45.
Ascalaphidæ, **24,** 29.
asperius, Eubelum, 47, **86** (Figs. 63–70), 89, 91.
Atarba, 10.
atlas, Myrmeleon, 27.

bacillus, Disparomitus, **25,** 29.
  Suphalasca, 25.
bananæ, Cubaris, 47, **97,** 98 (Figs. 112–117), 100.
Banyutus, 28.
  acutus, 28.
  insidiosus, 28.
  lethalis, 28.
  maynei, 28.
  neuter, 28.
baudiniana, Ligia, 73.
bayeri, Palpares, 26.
bequaerti, Chrysopa, **25,** 30.
  Helicomitus, 29.
bicauda, Megistocera, 15.
bigranulatum, Sphæroma, 67.
bipunctata, Œstropsis, 32.
bipunctatus, Polymorphaniscus, **32,** 33.
Bittacus, **30,** 31.
  montanus, 31.
  pobeguini, 31.
  schoutedeni, 31.
  weelei, **30,** 31.
Bittacusidæ, **30,** 31.
bituberculatus, Cubaris, 100.

---

[1] See pp. 333 and 469 for indexes to Articles VI and VIII.

bizonatum, Eubelum, 44.
bizonatus, Periscyphops, 44.
Bopyridæ, **67,** 69.
Bopyroidea, 47, 67.
Brachiella, 2, **7.**
    chevreuxii, 8.
    macrura, 7, 8. Pl. II, figs. 23–28.
brachygaster, Centroclisis, 26.
brunettiana, Tipula, 15.
Bubo festivus, 24.
Bufo regularis, 81, 83, 102.

Cænis, 38, 39.
Cænopsis, 39.
    fugitans, 39, 40. Pl. V, figs. 3–11.
Callianassa, 72.
callianassæ, Pseudione, 72.
camerunensis, Neoperla, 36, 37.
capense, Macronema, 33.
capense var. signatum, Macronema, 33.
capensis, Anilocra, 43.
carangis, Eurydice, 47, **49,** 50 (Figs. 1–3), 51 (Fig. 4), 52 (Fig. 5).
Caranx, 53, 57.
    hippos, 53.
Catoxyethira, 32.
    fasciata, 32.
Centroclisis, **22,** 26.
    brachygaster, 26.
    distincta, 22.
    lineatipennis, 26.
    mordax, **22,** 26.
    perversa, 26.
    rufescens, 26.
cephalotes, Nerocila, 43, 47, **53,** 54 (Figs. 6 and 7), 56 (Figs. 8 and 9), 75, 59.
cepholotes, Nerocila, 53.
Ceratocheilus, 10.
cercata, Necyla, 30.
chapini, Nephrotoma, 19. Pl. IV, fig. 5.
    Pseudione, 47, **69,** 70 (Figs. 23–26).
chevreuxii, Brachiella, 8.
Chrysopa, **25,** 30.
    bequaerti, **25,** 30.
    congrua, 30.
    ducissa, 30.
    rufostigma, 25.
Chrysopidæ, **25,** 30.
Cirolana, 43, 53.
    cranchii, 43.
    swainsonii, 43.
Cirolanidæ, 49.
clavata, Nephoneura, 29.
cognatus, Gymnoleon, 27.
    Palpares, 26.
concinna, Limnobia, 13.
congicus, Polypterus, 6.
congoënsis, Elasmopus, 371, 372 (Figs. 1 and 2).
congoensis, Limnobia, 11. Pl. IV, fig. 1.
congolana, Gibrella, 27.
congolensis, Cymothales, 28.
congrua, Chrysopa, 30.
Conosia, 10.
conradti, Neoperla, 36.
Copepods, 1.
coriacea, Ligia, 73.
cranchii, Cirolana, 43.
Creagris, **23,** 27.
    africana, **24,** 27.
    latens, 28.
    nubifer, **23,** 27.
cridai, Cueta, 28.
cristifrons, Periscyphis, 45.
    Synarmadillo, 45.
cruciata, Lernæa, 5.
Ctenacroscelis, 10.
    albovittatus, 18.
Cubaris, 45, 47, **97.**
    aculeata, 45.
    bananæ, 47, **97,** 98 (Figs. 112–117), 100.
    bituberculatus, 100.
    echinatus, 99.
    formicarum, 102.
    liliputanus, 100.
    nanus, 100.
    regulus, 47, **100,** 101 (Figs. 118–121).
Cueta, **22,** 28.
    cridai, 28.
    mysteriosa, **22,** 28.
    punctatissima, 28.
    styczynskii, 28.

cunningtoni, Anchiphiloscia, 45.
  Philoscia, 45.
curtata, Pseudione, 72.
Cylindrotominæ, 9.
Cymothales, **24,** 28.
  congolensis, 28.
  delicatus, 28.
  dulcis, 24.
  johnstoni, **24,** 28.
  liberiensis, 28.
  mirabilis, 28.
Cymothoa, 43, 47, **59.**
  plebeia, 43, 47, **59,** 60 (Figs. 12 and 13).
Cymothoidæ, 49, 53.
Cymothoidea, 49.
Cymothoinæ, 53.

Dapanoptera, 13.
Dasypus, 97.
deceptor, Ecnomus, 33.
delicatus, Cymothales, 28.
deshayesiana, Æga, 43.
  Rocinela, 43.
destructor, Sphæroma, 47, **63,** 64 (Figs. 16 and 17), 65 (Fig. 18), 66 (Fig. 19), 67.
Dicolpus, 30.
  volucris, 30.
Dicranomyia, 9, 12, 13.
  eiseni, 12.
  globithorax, 12.
  gloriosa, 12.
  nebulosa, 12.
  pilipennis, 12.
  pubipennis, 12.
  rara, 12.
  simulans, 12.
  umbrata, 13.
  venusta, 13.
didita, Neoperla, 36.
diminuta, Hydropsychodes, 33.
Diploexochus, 45, 47, 97, 99.
  aculeatus, 45.
Dipseudopsis, **31,** 32.
  africana, 32.
  fasciata, **31,** 32.
  lata, 32.
  schoutedeni, 32.
  simplex, 32.
dispar, Æthaloptera, **31,** 33.
Disparomitus, **25,** 29.
  bacillus, **25,** 29.
  longus, 29.
distincta, Centroclisis, 22.
dohrni, Pseudione, 72.
Dolichopeza, 10, 16.
dolichopezoides, Tipula, 15. Pl. IV, fig. 3.
dubia, Neoperla, 35, **37,** 40. Pl. V, figs. 12, 14, and 16.
ducissa, Chrysopa, 30.
dulcis, Cymothales, 24.

Eatonica, 38.
echinatus, Cubaris, 99.
Ecnomus, 33.
  deceptor, 33.
  tropicus, 33.
eetveldii, Eugnathichthys, 63.
eiseni, Dicranomyia, 12.
Elasmopus, 371.
  congoënsis, 371, 372 (Figs. 1 and 2).
Elephantomyia, 10.
Empeda, 9.
Encyoposis, 29.
  hemistigma, 29.
  nigrostigma, 29.
Ephemerida, 38.
Epicaridea, 67.
Eriocera, 9, 10.
Erioptera, 9, 10.
Eriopterini, 9, 13.
Eubelidæ, 78.
Eubelinæ, 78.
Eubelum, 44, 45, 47, 48, **78,** 92.
  albicorne, 44.
  asperius, 47, **86** (Figs. 63–70), 89, 91.
  bizonatum, 44.
  garambæ, 47, 88 (Figs. 71–78), **89** (Fig. 79).
  gibbosum, 44.
  hilgendorfii, 45.
  ignavum, 87.

  instrenuum, 83, 87.
  lubricum, 44, 84.
  pila, 45.
  propinquum, 47, **84,** 85 (Figs. 56–62), 102.
  quadrimaculatum, 44.
  silvanum, 44.
  squamatum, 44.
  squamosum, 44.
  stanleyanum, 47, **78,** 79 (Figs. 35–44), 80 (Fig. 45), 81.
  stipulatum, 44, 47, **81,** 82 (Figs. 46–54), 83 (Fig. 55), 84, 86, 87, 89, 91.
  tenebrarum, 47, 90 (Figs. 80–89), 91 (Fig. 90).
Eugnathichthys eetveldii, 63.
Eurydice, 47, **49,** 53.
  carangis, 47, **49,** 50 (Figs. 1–3), 51 (Fig. 4), 52 (Fig. 5).
  natalensis, 53.
Eurydicidæ, 49.
Eurydicinæ, 49.
Excirolana, 53.
excisa, Neoperla, **36,** 37, 38, 40. Pl. V, figs. 13, 15, and 17.
exotica, Ligia, 72, 77, 78.
  Ligyda, 47, **72,** 74 (Fig. 27), 75 (Figs. 28–30), 77, 78.
expansus, Ichthyoxenos, 47, **60,** 61 (Fig. 14), 62 (Fig. 15).
externa, Mossa, 28.

fasciata, Catoxyethira, 32.
  Dipseudopsis, **31,** 32.
  Œcetis, 33.
festiva, Limnobia, 13.
festivus, Bubo, 24.
  Helicomitus, **24,** 25, 29.
  Palpares, 22.
filiformis, Myrmeleon, 23.
  Neuroleon, **23,** 28.
Flabellifera, 49.
Flabelloidea, 47.
Formicaleon, **23,** 27.
  harpalyce, **23,** 27.
  lethalis, 27.
  recurvus, 27.
  scolius, 27.
  tholloni, 27.
  turbidus, **23,** 27.
Formicaleo turbidus, 23.
formicarum, Cubaris, 102.
fugitans, Cænopsis, 39, 40. Pl. V, figs. 3–11.
fulgens, Neomænis, 7.
furcata, Pseudione, 72.
  Upogebia, 69, 72.
fuscipennis, Nephrotoma, 20.

Galathea, 69.
Gammaridæ, 371.
Gammaridea, 371.
garambæ, Eubelum, 47, 88 (Figs. 71–78), **89** (Fig. 79).
gaudichaudii, Ligia, 73.
Geranomyia, 9.
gibbosum, Eubelum, 44.
gibbosus, Periscyphops, 44.
Gibrella, 27.
  congolana, 27.
globiceps, Rhyscotus, 45.
globithorax, Dicranomyia, 12.
globus, Synarmadillo, 45, 47, **92,** 93 (Figs. 91–99), 94 (Fig. 100).
gloriosa, Dicranomyia, 12.
Glossobius, 43.
  laticauda, 43.
  linearis, 43.
Gnophomyia, 9, 10.
goliath, Hydrocyon, 2.
Goniodineura, 13.
Gonomyella, 10.
Gonomyia, 9.
gracilipes, Ligia, 44, 78.
  Ligyda, 44.
grandis, Ligia, 73.
Griala, 27.
  macilenta, 27.
Grubia, 378.
Gymnoleon, 27.
  cognatus, 27.

Habromastix, 10.
Hagenomyia, 26.
  imperator, 26.

indistincta, 26.
lyncea, 26.
tristis, 26.
hamatus, Palpares, **21,** 26.
haplocephala, Lernæa, 5. Pl. III, figs. 20–22.
harpalyce, Formicaleon, **23,** 27.
haullevillei, Suhpalacsa, 29.
Helicomitus, **24,** 29.
bequaerti, 29.
festivus, **24,** 25, 29.
rutilus, 25.
Hemerobiidæ, 30.
hemistigma, Encyoposis, 29.
hennini, Nemopistha, 28.
Hexatoma, 10.
Hexatomini, 9.
hilgendorfii, Eubelum, 45.
hippos, Caranx, 53.
Hyale nilssoni, 378.
prevostii, 378.
hyalinum, Protomacronema, **32,** 33.
Hydrocyon goliath, 2.
Hydropsychidæ, **31,** 33.
Hydropsychodes, **31,** 33.
albomaculata, 33.
diminuta, 33.
sexfasciata, **31,** 33.
Hydroptilidæ, 32.

Ichthyoxenos, 47, 48, **60,** 63.
expansus, 47, **60,** 61 (Fig. 14), 62 (Fig. 15).
ictericus, Palpares, 26.
Idiotipula, 10.
ignavum, Eubelum, 87.
imperator, Hagenomyia, 26.
indica, Limnobia, 13.
indigena, Limnobia, 12.
indistincta, Hagenomyia, 26.
insidiosus, Banyutus, 28.
instrenuum, Eubelum, 83, 87.
interruptus, Macronemurus, 27.
intractabilis, Allocormodes, 29.
iolanthe, Macronemurus, 27.
Isopoda, 41.
italica, Ligia, 73.

jocosa, Tipula, 17.
johnstoni, Cymothales, **24,** 28.

kituanus, Nemoleon, 27.

langi, Pleurocrypta, 47, **67,** 68 (Figs. 20–22).
Tipula, 16. Pl. IV, fig. 4.
langi rubricapilla, Tipula, 17.
lata, Dipseudopsis, 32.
latens, Creagris, 28.
laticauda, Glossobius, 43.
laticollis, Neoperla, 36.
latipennis, Palpares, 26.
latro, Palpares, **22,** 26.
Lecteria, 10, **14,** 15.
africana, 11, **14,** 15. Pl. IV, fig. 2.
Leiponeura, 10.
leonina, Nosa, 26.
lepidus, Macronemurus, **23,** 27.
leplaei, Nagacta, 29.
Leptoceridæ, 33.
Leptocerus, 33.
trivittatus, 33.
Leptotipula, 10.
Leptotrichus, 45, 102.
squamatus, 102.
Lernæa, 1, 5.
cruciata, 5.
haplocephala, 5. Pl. III, figs. 20–22.
Lernæocera, 1.
leroiana, Neoperla, 36, 38.
lethalis, Banyutus, 28.
Formicaleon, 27.
lethifer, Myrmeleon, 27.
leucomatodes, Lysmus, 30.
liberiensis, Cymothales, 28.
Libnotes, 9, 10, 12, 13.
Ligia baudiniana, 73.
coriacea, 73.
exotica, 72, 77, 78.
gaudichaudii, 73.
gracilipes, 44.
grandis, 73.
italica, 73.
malleata, 73.
olfersii, 77.
Ligyda, 44, 47, 72.

  exotica, 47, **72,** 74 (Fig. 27), 75 (Figs. 28–30), 77, 78.
  gracilipes, 44, 78.
  olfersii, 47, 73, 76 (Fig. 31), **77** (Figs. 32–34).
Ligydidæ, 72.
liliputanus, Cubaris, 100.
Limnobia, 10, **11,** 12, 13.
  concinna, 13.
  congoensis, 11. Pl. IV, fig. 1.
  festiva, 13.
  indica, 13.
  indigena, 12.
  longinervis, 13.
  tinctinervis, 13.
  uniflava, 12.
Limnobiinæ, 11.
Limnobiini, 9.
Limnophila, 9, 10.
linearis, Glossobius, 43.
lineatipennis, Centroclisis, 26.
Livoneca, 63.
lombardi, Nyutus, 28.
longicornis, Syngenes, 26.
longinervis, Limnobia, 13.
Longurio, 10.
longus, Disparomitus, 29.
lubilensis, Synarmadillo, 47, **95,** 96 (Figs. 101–110), 97 (Fig. 111).
lubricum, Eubelum, 44, 84.
lyncea, Hagenomyia, 26.
Lysmus, 30.
  leucomatodes, 30.

macilenta, Griala, 27.
Macroleon, 27.
  polyzonus, 27.
Macronema, 33.
  capense, 33.
  capense var. signatum, 33.
Macronemurus, **23,** 27.
  interruptus, 27.
  iolanthe, 27.
  lepidus, **23,** 27.
Macrura, 72.
macrura, Brachiella, 7, 8. Pl. III, figs. 23–28.
maculicornis, Philoscia, 46.
maesi, Primerenca, 33.
malleata, Ligia, 73.
Mantispidæ, 30.
Mantispilla, 30.
  umbripennis, 30.
Maula, 28.
  stigmatus, 28.
maynei, Banyutus, 28.
Megistocera, 10, **15**.
  bicauda, 15.
mendica, Philoscia, 46.
Mesarmadillo, 44.
  albicornis, 44.
  quadrimaculatus, 44.
Metoponorthus pruinosus, 46.
mirabilis, Cymothales, 28.
Molophilus, 9.
montanus, Bittacus, 31.
mordax, Centroclisis, **22**, 26.
  Sogra, 22.
Mossa, 28.
  externa, 28.
Myrmeleon, **22,** 27.
  africanus, 24.
  atlas, 27.
  filiformis, 23.
  lethifer, 27.
  mysteriosus, 22.
  obscurus, **22,** 27.
  simplicissimus, 27.
Myrmeleonidæ, **21,** 25.
mysteriosa, Cueta, **22**, 28.
mysteriosus, Myrmeleon, 22.

Nagacta, 29.
  leplaei, 29.
  schoutedeni, 29.
Nanomitus, 29.
  sellatus, 29.
nanus, Cubaris, 100.
  Periscyphus, 45.
natalensis, Eurydice, 53.
nebulosa, Dicranomyia, 12.
Necyla, 30.
  cercata, 30.
  perparva, 30.
Nelees, 26.
Nemoleon, 27.

- kituanus, 27.
- Nemopistha, 28.
  - hennini, 28.
- Nemopteridæ, 28.
- Neomænis fulgens, 7.
- Neoperla, **35,** 37.
  - africana, 36.
  - camerunensis, 36, 37.
  - conradti, 36.
  - didita, 36.
  - dubia, 36, **37,** 40. Pl. V, figs. 12, 14, and 16.
  - excisa, **36,** 37, 38, 40. Pl. V, figs. 13, 15, and 17.
  - laticollis, 36.
  - leroiana, 36, 38.
  - nigricauda, 36.
  - sjöstedti, 36, 37.
  - spio, 35, 36.
  - tenera, 36.
  - transvaalensis, 36.
- Nephoneura, 29.
  - clavata, 29.
- Nephrotoma, 10, 19.
  - **chapini**, 19. Pl. IV, fig. 5.
  - fuscipennis, 20.
  - **ruwenzoriana**, 20. Pl. IV, fig. 6.
  - tigrina, 20.
- Nerocila, 43, 47, **53**.
  - acuminata, 59.
  - cephalotes, 43, 47, **53,** 54 (Figs. 6 and 7), 56 (Figs. 8 and 9), 57, 59.
  - *cepholotes*, 53.
  - rhabdota, 43, 47, **57,** 58 (Figs. 10 and 11).
- Neteja, 27.
  - sollicita, 27.
- Neuroleon, **23,** 28.
  - alcidice, 28.
  - filiformis, **23**, 28.
- Neuroptera, 21, 25.
- neuter, Banyutus, 28.
- Niambia, 45, 47, **102**.
  - squamata, 45, 47, **102,** 103 (Figs. 122 and 123), 104 (Figs. 124–126).
- nigrescens, Palpares, 26.
- nigricauda, Neoperla, 36.
- nigrostigma, Encyoposis, 29.
- nilssoni, Hyale, 378.
- nobilis, Nosybus, 30.
- normalis, Palpares, 26.
- *Nosa*, 22.
  - *leonina*, 26.
- Nosybus, 30.
  - nobilis, 30.
- Nothochrysa, **25,** 30.
  - rufostigma, **25,** 30.
  - temerata, 30.
- nubifer, Creagris, **23,** 27.
- Nyctiophylax, 32.
  - occidentalis, 32.
- Nyutus, 28.
  - lombardi, 28.

- obscuripennis, Palparellus, 26.
- obscurus, Myrmeleon, **22,** 27.
  - Ophiocephalus, 3.
  - Psaronius, 15.
- obsoletus, Palpares, 26.
- occidentalis, Nyctiophylax, 32.
- Ochthopetina, 35.
- Œcetis, 33.
  - fasciata, 33.
- *Œstropsis bipunctata*, 32.
- *olfersii, Ligia*, 77.
  - Ligyda, 47, 73, 76 (Fig. 31), **77** (Figs. 32–34).
- Oniscidæ, **78,** 87.
- *Oniscidæ*, 92.
- Oniscinæ, 92.
- Oniscoidea, 47, **72**.
- Ophiocephalus obscurus, 3.
- Orchestia, 377.
  - platensis, 377.
- Orimarga, 10.
- Orimargula, 10.
- Ormosia, 10.
- ornatipinnis, Polypterus, 5.
- Oropeza, 16.
- Osmylidæ, 30.

- Paguridæ, 69.
- Palparellus, 26.
  - obscuripennis, 26.
- Palpares, **21,** 25, 26.
  - abyssinicus, **22**, 25

  ægrotus, 25, 26.
  bayeri, 26.
  cognatus, 26.
  festivus, 22.
  hamatus, **21,** 26.
  ictericus, 26.
  latipennis, 26.
  latro, **22**, 26.
  nigrescens, 26.
  normalis, 26.
  obsoletus, 26.
  radiatus, 26.
  stuhlmanni, 26.
  tigris, 21, 26.
Panorpata, **30**, 31.
Parione, 71.
Pediciini, 9.
Pentagenia, 38.
  schoutedeni, **38**, 40. Pl. V, figs. 1 and 2.
Peripheroptera, 13.
Periscyphis, 45.
  cristifrons, 45.
  nanus, 45.
  pygmæus, 45.
Periscyphops, 44.
  bizonatus, 44.
  gibbosus, 44.
  silvanus, 44.
  squamatus, 44.
  squamosus, 44.
Perlidæ, 37.
perparva, Necyla, 30.
perversa, Centroclisis, 26.
Phalascusa, 30.
  vassei, 30.
Phanostoma, 33.
  senegalense, 33.
Philoscia, 45, 46.
  cunningtoni, 45.
  maculicornis, 46.
  mendica, 46.
pila, Eubelum, 45.
pilipennis, Dicranomyia, 12.
platensis, Orchestia, 377.
Platylimnobia, 10.
plebeia, Cymothoa, 43, 47, **59**, (Figs. 60 12 and 13).
Plecoptera, 35.
Pleurocrypta, 47, **67,** 69.
  langi, 47, **67,** 68 (Figs. 20–22).
pobeguini, Bittacus, 31.
Podoneura, 10.
Polycentropidæ, **31,** 32.
Polymorphaniscus, **32,** 33.
  bipunctatus, **32,** 33.
Polypterus, 6.
  congicus, 6.
  ornatipinnis, 5.
polyzonus, Macroleon, 27.
Porcellana, 69.
Porcellio, 45, 46.
  pruinosus, 46.
  squamatus, 45, 102.
Porcellionides, 46.
prevostii, Hyale, 378.
Primerenca maesi, 33.
propinquum, Eubelum, 47, **84,** 85 (Figs. 56–62), 102.
Protodipseudopsis, 32.
  sjœstedti, 32.
Protomacronema, **32,** 33.
  hyalinum, **32,** 33.
  pubescens, 33.
pruinosus, Metoponorthus, 46.
  Porcellio, 46.
Psaronius, 15.
  obscurus, 15.
Psettus sebæ, 57.
Pseudione, 47, 69.
  callianassæ, 72.
  chapini, 47, **69,** 70 (Figs. 23–26).
  curtata, 72.
  dohrni, 72.
  furcata, 72.
  upogebiæ, 72.
Pseudoleptocerus, 33.
  squamosus, 33.
Pseudoperla, 35.
Psychomyidæ, 33.
Ptychoptera, 9.
Ptychopteridæ, 9.
pubescens, Protomacronema, 33.
pubipennis, Dicranomyia, 12.
punctatissima, Cueta, 28.
pygmæus, Periscyphis, 45.

quadrimaculatum, Eubelum, 44.
quadrimaculatus, Mesarmadillo, 44.

radiatus, Palpares, 26.
rara, Dicranomyia, 12.
recondita, Suhpalacsa, 29.
recurvus, Formicaleon, 27.
regularis, Bufo, 81, 83, 102.
regulus, Cubaris, 47, **100**, 101 (Figs. 118–121).
reticulatus, Argulus, 2. Pl. I, figs. 1–10.
rhabdota, Nerocila, 43, 47, **57,** 58 (Figs. 10 and 11).
Rhamphidia, 10.
Rhipidia, 9, 10, 12, 13.
Rhyscotus, 45.
  globiceps, 45.
roccatii, Synarmadilloides, 46.
Rocinela deshayesiana, 43.
rubricapilla, Tipula langi, 17.
rufescens, Centroclisis, 26.
rufostigma, Chrysopa, 25.
  Nothochrysa, **25,** 30.
rutila, Suphalasca, 25.
rutilus, Helicomitus, 25.
ruwenzoriana, Nephrotoma, 20. Pl. IV, fig. 6.

Scamboneura, 10.
schoutedeni, Bittacus, 31.
  Dipseudopsis, 32.
  Nagacta, 29.
  Pentagenia, **38,** 40. Pl. V, figs. 1 and 2.
scolius, Formicaleon, 27.
sebæ, Psettus, 57.
sellatus, Nanomitus, 29.
senegalense, Phanostoma, 33.
Setodellina, 33.
  albopunctata, 33.
sexfasciata, Hydropsychodes, **31,** 33.
signatum, Macronema capense var., 33.
silvanum, Eubelum, 44.
silvanus, Periscyphops, 44.
simplex, Dipseudopsis, 32.
simplicissimus, Myrmeleon, 27.
simulans, Dicranomyia, 12.
sjöstedti, Neoperla, 36, 37.
sjœstedti, Protodipseudopsis, 32.
Sogra, 22, 26.
  mordax, 22.
sollicita, Neteja, 27.
Sphæroma, 41, 47, **63.**
  bigranulatum, 67.
  destructor, 47, **63,** 64 (Figs. 16 and 17), 65 (Fig. 18), 66 (Fig. 19), 67.
  terebrans, 64, 67.
  vastator, 67.
Sphæromidæ, 63.
spio, Neoperla, 35, 36.
splendens, Tipula, 15.
  Tipula, 15.
squamata, Niambia, 45, 47, **102,** 103 (Figs. 122 and 123), 104 (Figs. 124–126).
squamatum, Eubelum, 44.
squamatus, Leptotrichus, 102.
  Periscyphops, 44.
  Porcellio, 45, 102.
squamosum, Eubelum, 44.
squamosus, Periscyphops, 44.
  Pseudoleptocerus, 33.
stanleyanum, Eubelum, 47, **78,** 79 (Figs. 35–44), 80 (Fig. 45), 81.
stigmatus, Maula, 28.
stipulatum, Eubelum, 44, 47, **81,** 82 (Figs. 46–54), 83 (Fig. 55), 84, 86, 87, 89, 91.
stuhlmanni, Palpares, 26.
styczynskii, Cueta, 28.
Styringomyia, 10.
subcostalis, Suhpalacsa, 29.
Suhpalacsa, 29.
  haullevillei, 29.
  recondita, 29.
  subcostalis, 29.
Suphalasca bacillus, 25.
  rutila, 25.
swainsonii, Cirolana, 43.
Synarmadillo, 44, 45, 47, **92.**
  albinotatus, 44.
  cristifrons, 45.
  globus, 45, 47, **92,** 93 (Figs. 91–99), 94 (Fig. 100).

  lubilensis, 47, **95,** 96 (Figs. 101–110), 97 (Fig. 111).
Synarmadilloides, 46.
  roccatii, 46.
Syngenes, 26.
  longicornis, 26.

Talitridæ, 371, **373.**
Talorchestia, 373.
  tricornuta, 371, **373,** 374 (Figs. 3 and 4), 376 (Fig. 5), 377 (Fig. 6).
Tanyderidæ, 9.
Tasiocera, 10.
temerata, Nothochrysa, 30.
tenebrarum, Eubelum, 47, 90 (Figs. 80–89), **91** (Fig. 90).
tenera, Neoperla, 36.
terebrans, Sphæroma, 64, 67.
Teucholabis, 9, 10.
tholloni, Formicaleon, 27.
tigrina, Nephrotoma, 20.
tigris, Palpares, 21, 26.
tinctinervis, Limnobia, 13.
Tipula, 10, **15,** 16.
  abdominalis, 18.
  brunettiana, 15.
  dolichopezoides, 15. Pl. IV, fig. 3.
  jocosa, 17.
  langi, 16. Pl. IV, fig. 4.
  langi rubricapilla, 17.
  sp., **17,** 18 (Fig. 1).
  splendens, 15.
  splendens, 15.
Tipulidæ, 9, 11.
Tipulinæ, 9, 15.
Tipulodina, 10.
Tmesibasis, **24,** 29.
  alberti, 29.
  waelbroecki, **24,** 29.
Toxorhina, 10.
transvaalensis, Neoperla, 36.
Trentepohlia, 9, 10.
Trichodolichopeza, 16.
Trichoptera, 31, 32.
tricornuta, Talorchestia, 371, **373,** 374 (Figs. 3 and 4), 376 (Fig. 5), 377 (Fig. 6).
Trimicra, 10.
tristis, Hagenomyia, 26.
trivittatus, Leptocerus, 33.
tropicus, Ecnomus, 33.
Thrypticomyia, 10.
turbidus, Formicaleo, 23.
  Formicaleon, **23,** 27.

umbrata, Dicranomyia, 13.
umbripennis, Mantispilla, 30.
uniflava, Limnobia, 12.
Upogebia, 69, 72.
  furcata, 69, 72.
upogebiæ, Pseudione, 72.

vassei, Phalascusa, 30.
vastator, Sphæroma, 67.
venusta, Dicranomyia, 13.
volucris, Dicolpus, 30.

waelbroecki, Tmesibasis, **24,** 29.
webbii, Æga, 43.
weelei, Bittacus, **30,** 31.

QH
1
A4
v.43

Biological
& Medical
Serials

American Museum of Natural
History, New York
Bulletin

PLEASE DO NOT REMOVE
CARDS OR SLIPS FROM THIS POCKET

UNIVERSITY OF TORONTO LIBRARY

STORAGE